



# Integration Note

Manufacturer:	Lutron
Model Number(s):	<b>RadioRA 2 (QS) Lighting and Climate Control</b>
Minimum Core Module Version:	ELAN 5.4 <b>Fan Controller: ELAN 6.4.200</b>
Comments:	RadioRA2 Inclusive Software v5.0.8 or newer
Document Revision Date:	12/15/16

## OVERVIEW AND SUPPORTED FEATURES

The Lutron RadioRA2 system is a wireless, RF based communicating lighting system. RadioRA2 supports RS-232 or Ethernet, 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.

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**Note:** The auto discovery is only possible via Ethernet connection. See Lutron Programming Overview for notes on discovering devices automatically.

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**Lighting Load Control:** Control and feedback of lighting load devices in the RadioRA2 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:** RA2 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.

**IMPORTANT: Complex Custom Scenes should be implemented with Lutron Custom Scenes and not ELAN Customizable Scenes. Feedback from the Lutron device can interrupt the ELAN controller’s execution of the scene and prevent the complete scene from being executed.**

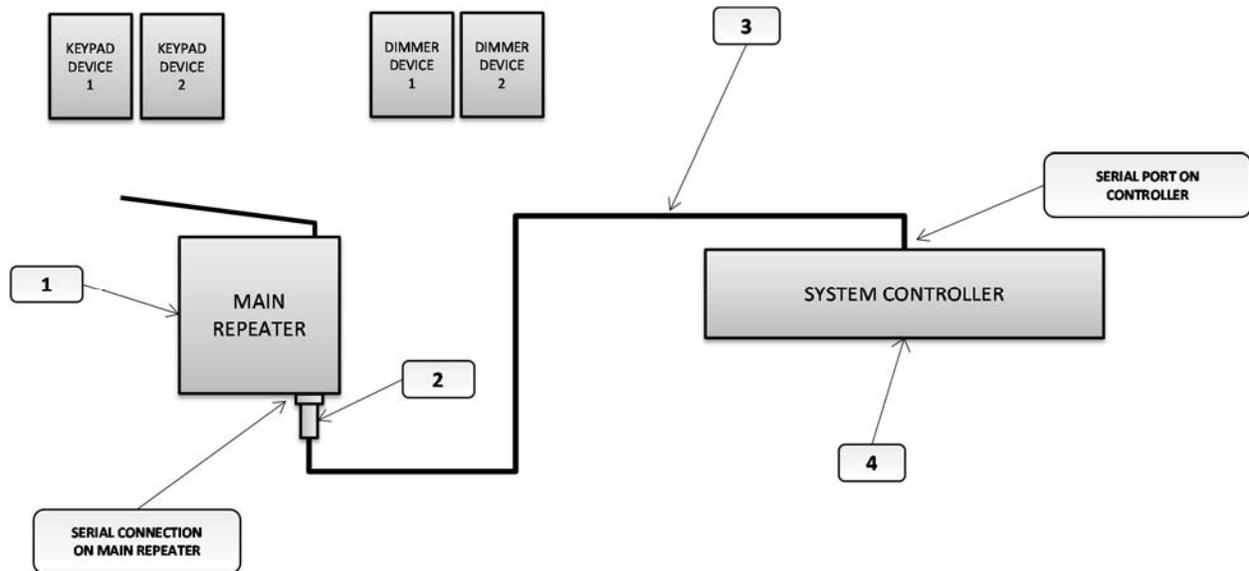
<b>Supported Radio RA2 Devices</b>	
Main Repeater/Aux Repeater	RR-MAIN-REP-WH, RR-AUX-REP-WH
Dimmers & Switches	RRD-6D, RRD-6NA, RRD-8ANS, RRD-8S-DV, RRD-10D, RRD-10ND, RRD-F6AN-DV, RRD-3LD
Visor Control Receiver	RR-VCRX
GRAFIK Eye	QSG
Plug-in Modules	RR-3PD, RR-15APS
Wall Mount Keypads	RRD-W1RLD, RRD-W2RLD, RRD-W3BD, RRD-W3BRL, RRD-W3BSRL, RRD-4S, RRD-W5BRL, RRD-W5BRLIR, RRD-W6BRL, RRD-W7B
Table Top Keypads	RR-T5RL, RR-T10RL, RR-T15RL
Hybrid Keypad	RRD-H1RLD, RRD-H21RLD, RRD-H3BSRL, RRD-H4S, RRD-H5BRL, RRD-H16RL
HVAC Control	LR-HVAC-1, LR-HWLHVAC
Shades	Sivoia QS Wireless Shades
Fan Controller*	RRD-2ANF
<p><i>Devices not present in this table are not supported</i></p> <p><i>*Devices require minimum ELAN core module listed at the top of this document.</i></p>	

**IMPORTANT: RadioRA2 systems must be programmed using RadioRA2 Lutron Inclusive software, or they are not compatible with external control. Do NOT program manually with key-presses.**

## 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:** The Discover Devices button for automatic device discovery does not work on RadioRA2 systems controlled via serial connections. Refer to the Automatic Device Discovery section below.

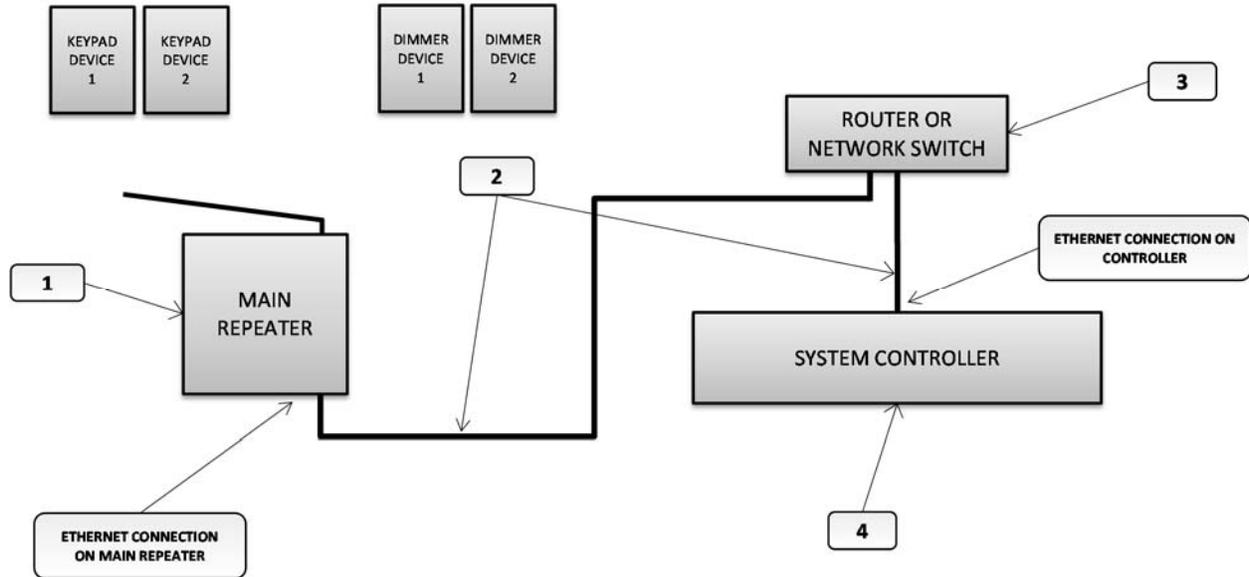


### BILL OF MATERIALS

#	Device	Manufacturer	Part Number	Protocol	Connector Type	Notes
1	RadioRA2 Master Repeater	Lutron	RR-MAIN-REP	RS-232	DB-9 Female	
2	DB-9M to RJ-45 Adapter	Elan	HA-CB-307	RS-232	DB-9 Male X RJ-45 Female	
3	Cat5 Cable Assy.	Installer	N/A	RS-232	RJ-45 Male X RJ-45 Male	Must terminate all 8 conductors
4	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	RadioRA2 Master Repeater	Lutron	RR-MAIN-REP	Ethernet	RJ45 Female	
2	Cat5 Cable Assy.	Installer	N/A	Ethernet	RJ-45 Male X RJ-45 Male	
3	Network Device	Various	Various (ex. HC-12)	Ethernet	RJ-45 Female	
4	Controller	Elan	Various (ex. HC-12)	Ethernet	RJ-45 Female	

## LUTRON PROGRAMMING OVERVIEW

The Lutron RadioRA2 system must be fully programmed using **Lutron RadioRA2 Inclusive** software prior to integration with ELAN. Program the RadioRA 2 according to standard Lutron programming procedures, with the following additional considerations:

**IMPORTANT: RadioRA2 systems must be programmed using RadioRA2 Inclusive software, or they are not compatible with external control. Do NOT program manually with key-presses.**

**Ethernet Control:** For reliable control, assign the Master Repeater a static IP address on the same network as the ELAN Controller. ELAN recommends assigning the first Ethernet Lighting Device to 192.168.0.50, the second to 192.168.0.51, and so on.

Assign the static IP during the “Design” phase of the programming.

- Find the repeater on the network using the “Find Main Repeater” button.
- When the repeater is found a dialog pop up shows the repeaters current configuration as shown below:

The screenshot shows the 'Find Main Repeater' dialog box. It has a title bar 'Find Main Repeater' and a 'Refresh' button in the top right. Below the title bar is a table with columns: Room, Serial Number, DHCP, IP Address, and Status. The first row shows 'Equipment Room' with Serial Number '006A27C1', DHCP 'Enabled', IP Address '192.168.0.229', and Status 'Online'. Below the table are input fields for 'Remote Access Address' (192.168.0.229) and 'Port' (51023). At the bottom, there is a 'Show Advanced' button, a 'Save Settings' button, and a 'Cancel' button. A log area at the very bottom shows two messages: '5:47:57 PM: Please select the serial number of the repeater in the corresponding room.' and '5:47:58 PM: Found 1 main repeater on the network.'

- Set DHCP to Disabled.
- Set the 1<sup>st</sup> lighting controller IP Address to 192.168.050, the second to 192.168.0.51 etc.
- Click the Show Advanced button and confirm the Subnet mask is set as 255.255.255.0
- The Remote Access Address, Port, and System Address fields can be left at their defaults.
- Finally, click the Save Settings button to assign the new settings. See the sample screen below.

The screenshot shows the 'Find Main Repeater' dialog box after configuration changes. The title bar is 'Find Main Repeater' and the 'Refresh' button is in the top right. The table below the title bar has columns: Room, Serial Number, DHCP, IP Address, and Status. The first row shows 'Equipment Room' with Serial Number '006A27C1', DHCP 'Disabled', IP Address '192.168.0.50', and Status 'Online'. Below the table are input fields for 'Remote Access Address' (192.168.0.229) and 'Port' (51023). At the bottom, there is a 'Hide Advanced' button, a 'Save Settings' button, and a 'Cancel' button. A log area at the very bottom shows two messages: '5:52:05 PM: Please select the serial number of the repeater in the corresponding room.' and '5:52:06 PM: Found 1 main repeater on the network.'

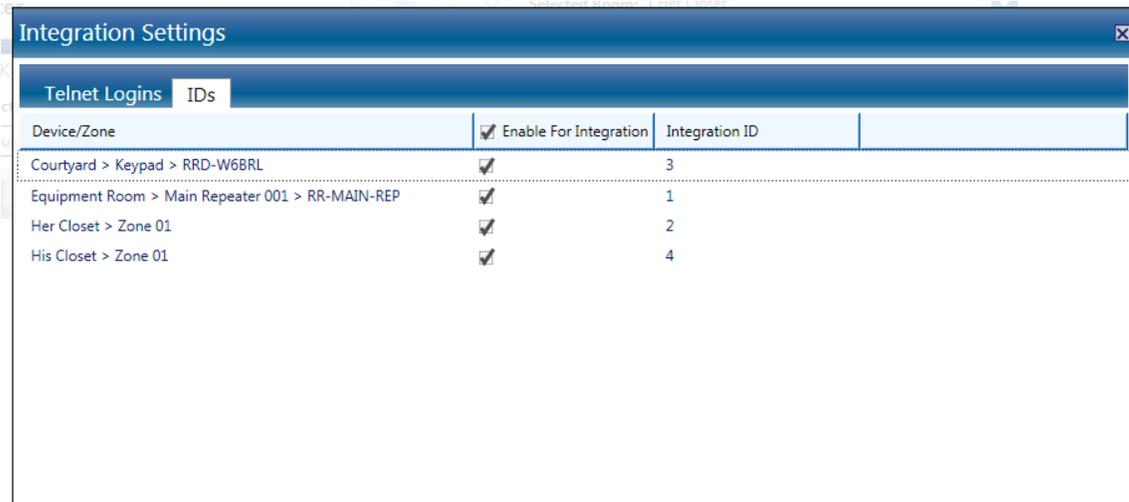
**Serial Control:**

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

**Locating Integration ID's:**

Integration ID's are the addresses used in by the system controller for communicating with RA2 devices. For reference, these may be obtained from the Lutron Software by clicking Settings> Integration, then selecting the ID's tab.

- Under Settings> Integration, Enable for Integration must be checked under the ID's tab for all devices. This should be the default setting.



The screenshot shows a window titled "Integration Settings" with two tabs: "Telnet Logins" and "IDs". The "IDs" tab is active, displaying a table with the following data:

Device/Zone	<input checked="" type="checkbox"/> Enable For Integration	Integration ID
Courtyard > Keypad > RRD-W6BRL	<input checked="" type="checkbox"/>	3
Equipment Room > Main Repeater 001 > RR-MAIN-REP	<input checked="" type="checkbox"/>	1
Her Closet > Zone 01	<input checked="" type="checkbox"/>	2
His Closet > Zone 01	<input checked="" type="checkbox"/>	4

**Automatic Device Discovery:** The ELAN system automatically reads in the compatible Lutron devices from the Main Repeater.

The Lutron RadioRA2 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 RadioRA2 system for Ethernet control then read in the system or alternatively you can manually add in the RA2 devices.

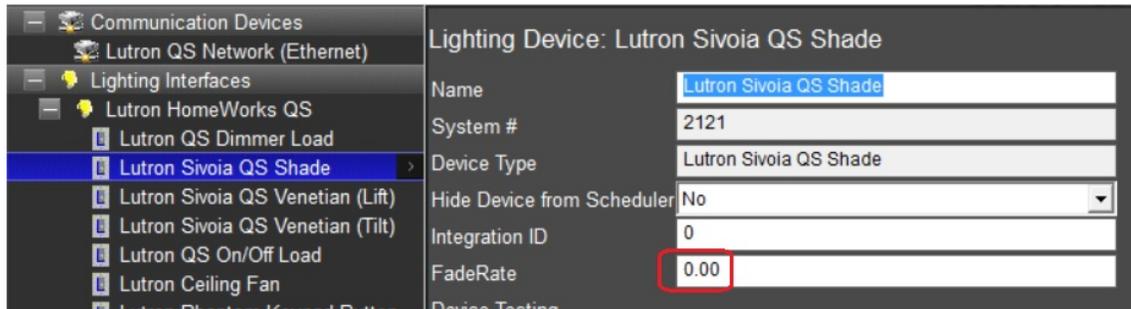
**Use the following procedure to automatically read in the RadioRA2 programming:**

1. Once all of the Lutron programming is complete perform a transfer to send all of the Lutron program information to the Main Repeater. This step is critical since the ELAN system must read the programming from the Main Repeater.
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 RadioRA2 QS Lighting Interface if it does not already exist.
5. Click the **Discover Devices** button at the bottom of the RadioRA2 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 a serial communication device for control. Refer to the ELAN Configuration Details section below for details.
8. Any time changes are made to the RadioRA2 configuration you will need to repeat this procedure to re-read in the system configuration and sync the ELAN configuration with the RadioRA2 system. Some notes below about re-discovering a RadioRA2 system:
  - a. The ELAN system will not delete any devices automatically from the configurator. If devices are deleted in the RadioRA2 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 RadioRA2 system and rediscovered it will need to be renamed manually in the configurator.

**Lutron Devices**: Review the following notes about the various RadioRA2 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 that are to be shown on the ELAN UI must be programmed as a Toggle Control, Single scene, or Path of Light.
  - Green Mode and Time Clock are NOT supported.
- **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 and 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 RA2 Inclusive 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 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)
<b>Communication Devices</b> <See Note 1 & 2>	<b>Name</b>	<User Defined> (Default: <b>Lighting</b> )	<User Defined> (Default: <b>Lighting</b> )
	<b>Type</b>	<b>Serial Port</b>	<b>Ethernet</b>
	<b>Communication Type</b>	<b>Lutron QS Network (RS-232)</b>	<b>Lutron QS Network (Ethernet)</b> (See Note 3)
	<b>Location</b>	<User Defined> (Not Required)	<User Defined> (Not Required)
	<b>COM Port/IP Address</b>	<Select Com Port from list>	<User Defined> ( <b>Enter IP address of Main Repeater</b> )
	<b>Port</b>	N/A	<23>
<b>Lighting Interface</b>	<b>Name</b>	<User Defined> (Default: <b>Lutron RadioRA2 QS</b> )	<User Defined> (Default: <b>Lutron RadioRA2 QS</b> )
	<b>Device Type</b>	<b>Lutron RadioRA2 QS</b>	<b>Lutron RadioRA2 QS</b>
	<b>COM Device</b>	<Select from list> (Default: <b>Lighting</b> )	<Select from list> (Default: <b>Lighting</b> )
	<<Click Discover Devices to query the repeater and automatically add the supported Lutron devices (See Notes 1 & 2)>>		
<b>Lighting Devices</b>	<b>Name</b>	<Auto Detect>	
	<b>System #</b>	<Auto Detect>	
	<b>Device Type</b>	<Auto Detect>	
	<b>Hide Device from Scheduler</b>	<User Defined> (Default: No)	
	<b>Location</b>	<Select from list> (Not Required)	
	<b>Integration ID</b>	<Auto Detect>	
<b>Keypad Interfaces</b>	<b>Name</b>	<Auto Detect> (See Note 4)	
	<b>Interface Device</b>	<Auto Detect> (Default: Lutron RadioRA2)	
	<b>Keypad Type</b>	<Auto Detect>	
	<b>Lighting Device</b>	<Auto Detect>	
<b>And / Or:</b>			
<b>Custom Tab</b>	Create Custom Lighting Interfaces using the available custom lighting controls, see the Online Help or Training Guide for details.		
<b>Thermostats</b>	<b>Name</b>	<User Defined> (Default: Thermostat1, etc.)	
	<b>Location</b>	<User Defined> (Not Required)	
	<b>Com Device</b>	<Auto Detect>	
	<b>Thermostat #</b>	<Auto Detect>	
	<b>Heating Unit</b>	<Select from list>	
	<b>Cooling Unit</b>	<Select from list>	
<b>HVAC Units</b>	<b>Name</b>	<User Defined>	
	<b>Model</b>	Generic HVAC Unit	
	<b>Controls Heat</b>	<Select from list>	
	<b>Controls Cooling</b>	<Select from list>	
	<b>Controls Fan</b>	<Select from list>	
<b>Schedules</b>	<b>HVAC Schedule</b>	<Select from list>	Select desired number of schedules
	<b>Programs</b>	<Select from list>	Select desired weekly programs
	<b>Monday - Sunday</b>	<Select days>	Select days that go together
	<b>Periods per Day</b>	<Select from list>	1, 2 or 4 periods per day
<b>Global Options</b>	<b>Units</b>	<Select from list>	Fahrenheit or Celsius
	<b>Temporary Hold Mode</b>	<Select from list>	Timed Hold or Hold until next schedule period
	<b>Temporary Hold Default Time</b>	<Select from list>	Select default Temporary Hold time
	<b>Outside Temperature Sensor</b>	<Select from list>	Choose optional sensor if installed or choose Internet
	<b>Outside Humidity Sensor</b>	<Select from list>	Choose optional sensor if installed or choose Internet
<b>Notes:</b>			
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 Main Repeater using its default Telnet login, username=lutron; password=integration			
4. GRAFIK 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.			

## 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 Main Repeater. The ELAN system reads in the programming from the Main Repeater, 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 RadioRA2 supports only one Telnet login per user/password. The ELAN system uses the Lutron default login of username: lutron and password: integration. Make sure there are no other PCs or controllers using this login.
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.