

ELK-M1XSLC

M1 Interface kit for Lutron Homeworks QS or Caséta Line

HOMWORKS® QS INSTRUCTIONS

APPLICATION:

The **ELK-M1XSLC** Interface Kit has been enhanced to support Lutron's Homeworks and Caséta products. Interfacing M1 Control to Lutron allows intelligent control of devices in response to security system actions or conditions. The most typical integration devices supported are: Lights, Shades, and Keypad controllers. The level of integration is dependent on which type and model of Lutron devices being implemented. Some models of Thermostats are also supported.

ELK-M1XSLU SPECIFICATIONS:

- Connects to the ELK-M1 Keypad Databus
- Addressable as a TYPE 5 Databus (ID 1-7)
- Operating Voltage: 12 Volts DC *Supplied from M1*
- Current Draw: 31mA
- Activity/Status LED (Orange)
- Auto-Reset Hardware Watchdog Circuit
- Housing Dimensions: 4.25" x 6.375" x 2.125"
- Circuit Board: 2.75" x 3.95"
- Connects to IP232 via RS232 and null modem (Incl.)
- Connects to M1 via 4 screw terminals

ELK-IP232 SPECIFICATIONS:

- Converts RS232 Serial to IP for connection to the IP port on Lutron's QS or Smartbridge Pro Interfaces
- LED Indicators for Power, Link, and Data
- Operating Voltage: 12 Volts D.C.
Supplied from ELK-P1216 Power Supply (Incl)
- Current Draw: 135 mA
- Dimensions: 3.85" L x 1.7" W x 0.93" D



To support integration with Homeworks QS, a firmware update to the M1XSLU is required. See page 4 for details.

Specifications are Subject to Change without notice.

NOTICE: Drawings, illustrations, diagrams, part numbers, etc. are provided as reference only and are based on equipment available at the time the information was created. All information contained in this document are subject to change without notice.

The extent of integration between Elk Products and Partner Mfgs varies, and there may be situations or limitations beyond Elk's control that make certain desirable features unavailable or unusable. Partner products and/or protocols, including Elk's may not contain the capabilities or data definitions to permit additional integration beyond what is currently available. Partners may also, at their option, add, modify, or discontinue features or support without notification.

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PLEASE READ THIS PAGE FIRST!

LUTRON HOMEWORKS® QS

The following components will be needed to integrate Elk to Lutron Homeworks QS.

Part Number & Description

ELK-M1 or M1EZ8 Control

ELK-M1XSLCv2 Kit

Contents of kit:

ELK-M1XSLU M1 to Lutron serial interface, **UPDATED with SPECIAL FIRMWARE VERSION 80.0.6** (see page 4)

ELK-IP232 Serial to IP Converter (Firmware version 1.0.18 and later *******)

9 Pin Serial ribbon cable

9 Pin Null Modem adapter

ELK-P1216 Plug-in 12VDC Power Supply

ELKRP Remote Programming Software. This can be downloaded from Elk Website www.elkproducts.com

ELK-IP232 Utility Software. This can be downloaded from Elk Website www.elkproducts.com

Lutron QS Processor w/plug-in Power Pack

Lutron QS System Devices

Lutron QS Design Software

Please refer to the following pages for the steps and requirements of interfacing.

***** The ELK-IP232 contained in this kit is pre-loaded with the most recent firmware version (v1.0.18 or later). If you already own an older IP232 and attempt to use it instead of the one supplied in this kit, the older unit will most likely need to be firmware update to the most recent version (v1.0.18 or later) prior to use.**

Overview: Lutron Homeworks QS devices communicate through a central interface, the Lutron Homeworks QS Processor. Supported devices include lights, shades and thermostats. The ELK-M1XSLU Lutron Interface handles the protocol conversion from ELK to Lutron and the ELK-IP232 creates the IP connectivity with the Lutron QS Processor.

Lutron Homeworks QS Designer Software: This software available from Lutron is REQUIRED for third party integration. It is not possible to integrate with the Homeworks QS system unless it was setup and programmed by the QS Designer software! Lutron Certification training may be required to obtain this software! This is restriction imposed by Lutron, not Elk.

Integration Capacity: Each HomeWorks QS processor can support up to 100 hardwired and up to 100 wireless devices in the Homeworks QS line. However, this does not mean that the Device ID numbers are restricted to 1-200. On the contrary, with installation it will be quite common to find active Devices with ID numbers higher than 200. The reason is that not only does each repeater, dimmer, switch, tabletop controller, thermostat, etc. counts as a device, but non-hardware entities such as rooms, floors, etc. are also assigned ID numbers, even though they are not physical controllable active devices. Also, devices that are connected directly to a load (dimmers, switches, etc.) may be assigned multiple devices IDs for both the load (zone) and the button (device). M1 (ElkRP) Lighting Device numbers stop at 255. This means that M1 cannot control or communicate with any physical active device that has an ID beyond 255. But there is a workable solution for this issue. The Lutron Homeworks QS software has a menu option which allows manual re-numbering of Device IDs. The solution is to identify any active physical Device IDs beyond 255, and then use the programming option to change or swap them with lower Device IDs currently assigned to non-hardware entities. In other words, arrange the network so that numbers above 255 are assigned to rooms, floors, etc., and reserve the numbers 255 and lower for active physical Devices.

Important: Do not attempt to integrate with Lutron Homeworks using any of Elk's other "standard" serial interface modules. ONLY the ELK-M1XSLC Kit provides the hardware and software for near plug-and-play integration with Lutron Homeworks.

2 - Equipment Setup

Please setup the Lutron equipment and devices and have them all working before proceeding.

- 2.1 Turn off the power to all equipment before making any wiring connections.
- 2.2 Wire the M1XSLU to the M1's RS485 data bus. Please follow the recommendations in the M1 Installation book and this manual for wiring the 4 conductors of the data bus (+12V, A, B, and Neg) to the terminals on the M1XSLU. You should never attach more than 2 homerun cables directly to the M1 Control! The preferred way to connect multiple bus devices to M1 is to either daisy chain connect them along each homerun wire, or add a data bus hub device (Elk M1DBH or M1DBHR) in the panel that will support connection of multiple homerun cables.
- 2.3 Wire the IP232 to the M1XSLU using the supplied DB9F to DB9M Serial ribbon cable and DB9M to DB9F Null Modem adapter. DO NOT use an extension or attempt to make this cord any longer!
- 2.4 Wire the IP232 to the Lutron Homeworks QS Processor using a CAT5 or CAT6 network cable (not supplied). The IP232 converts the serial topology of the M1XSLU into Ethernet (IP) topology allowing integration over IP to the Lutron Homeworks QS Processor.
- 2.5 Set the data bus address DIP switches on the M1XSLU to a value between 1 and 7 (see Table 1). Be sure the selected address is not already being used by another Elk serial expander (type 5) device. Each switch has an OFF and On position (binary value 0 or 1). The combination of these switches represents a decimal value between 0 (all Off) and 15 (all On).

TABLE 1: Data Bus Address Switch Settings							LEGEND
Address 1	Address 2	Address 3	Address 4	Address 5	Address 6	Address 7	<input checked="" type="checkbox"/> ON <input type="checkbox"/> OFF
<p>For Data Bus Type 5 Devices (Serial Expanders) the only valid Addresses are 1 thru 7 and therefore the maximum number of Type 5 Devices is 7. Data Bus Terminating Jumper JP1 – This engages a 120 Ohm resistor for terminating the M1 RS-485 Data Bus. See Data bus wiring instructions before use.</p>							

- 2.6 Wire the Lutron QS Processor to the LAN using a CAT5 or CAT6 network cable (not supplied). Power the Lutron device using it's appropriate power supply.
- 2.7 The IP232 will be powered by the supplied P1216 plug-in AC to DC power supply. Connect power supply to barrel connector on IP232.
- 2.8 If all wired connections are complete and secure it is now OK to apply power to the M1 Control which also supplies the power to the M1XSLU.
- 2.9 Perform a M1 Bus Module Enrollment to enroll the M1XSLU into the M1 Control. This can be done from a M1 Keypad or the ElkRP Software. From a Keypad access the Installer level programming and select Menu 01-Bus Module Enrollment. Press the right arrow key to start the enrollment. When complete press the right arrow (edit) key to view the results. NOTE: The ELK-M1XSLU shares the same bus type as other serial expanders and will display as a "SerialPExpdr T5" followed by a specific address (Addr) number. Verify the address displayed matches the address selected in step 2.5 above.

Should it ever be necessary to replace a ELK-M1XSLU; set the replacement unit to the same address as the old unit and perform the enrollment process. To permanently remove any data bus device perform the enrollment process AFTER disconnecting the device. This will help avoid a "missing device" trouble condition.

TABLE 2: Diagnostic LED Indicator
Slow blink (1/2 sec.) = Normal communication with M1.
Rapid flicker = Discovery Mode. The M1XSLU is synchronizing to collect current device data. This is automatically performed upon reboot or power up.
No blink = No communication with M1. Check the wiring with the M1 and that the device has power.

2.10 IMPORTANT! THE ELK-M1XSLU MUST BE UPDATED TO SPECIAL FIRMWARE VERSION 80.0.6 FOR COMPATIBILITY WITH LUTRON HOMEWORKS QS. This special firmware version can be downloaded from the support section of our website, www.elkproducts.com.

Procedures for Updating the M1XSLU firmware

- Connect a 9 pin serial cable or USB to serial adapter from the Computer to the 9 Pin RS232 Connector on the M1 Control. If you happen to have a M1XEP Ethernet module installed on the control, it may also be used for updating.
- Using ElkRP, open the account belonging to this control and establish a connection from the Connection menu.
- Use the "Receive All" option from the Send/Rcv menu to retrieve the very latest copy of all the data stored in the control.
- Save the account information.
- Click on the "Send/Rcv" menu/icon along the top of the PC screen, then click either "Update or Verify Firmware" OR "Enroll/Update Control and Devices"
- On the next screen you must choose the device to be updated.
- The Update screen will display the current Firmware, Hardware, and Bootware version, along with pull down selection to select the update file(s) that are available.

h. Choosing an update:

- Bootware Update:** This step may be skipped unless specifically required by the firmware update. Please refer to the release notes for the current update.

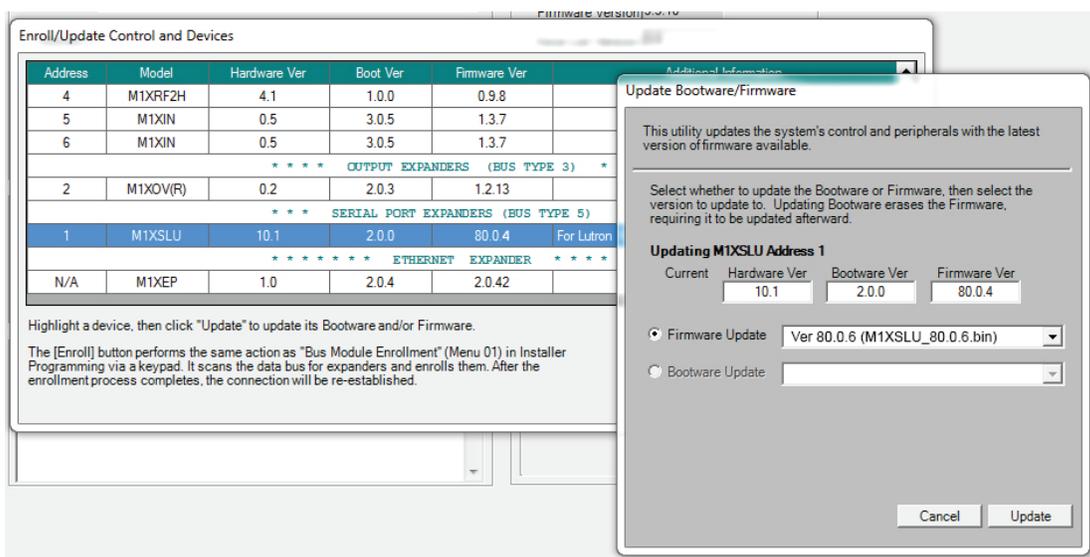
Use the scroll arrow to select the Bootware file for this update. Based on the hardware revision there may be more than 1 file. Just make sure the file selected contains the word "BOOT" and the current (latest) version number.

Select Update. Once the bootware update is complete you may proceed to the Firmware Update. The control may disconnect after the bootloader is finished. If so, just re-connect and continue on with the Firmware Update.

- Firmware Update:**

Use the scroll arrow to select the appropriate Firmware file for this update. Based on the hardware revision there may be more than 1 file. Just make sure that the file selected contains the current (latest) version number.

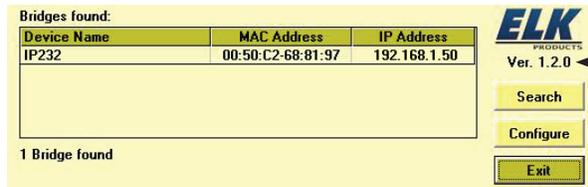
- Select Update. (In some instances the Update button may be labeled "Continue").



3 - Configuring the IP232 IP Interface

Download and install the IP232 Configuration PC software utility from the ELK website (www.elkproducts.com). A copy of the IP232 instructions is packed with the M1XSLC kit with steps for defaulting, resetting, or updating the IP232 firmware if needed.

- 3.1 Be sure the IP232 is connected to the local area network and is powered by the P1216 plug-in power supply.
- 3.2 Launch the Configuration Utility and click 'Search' to find the IP232 on the customer's local network. The Device Name (blank), MAC Address, and IP Address should appear in the display.

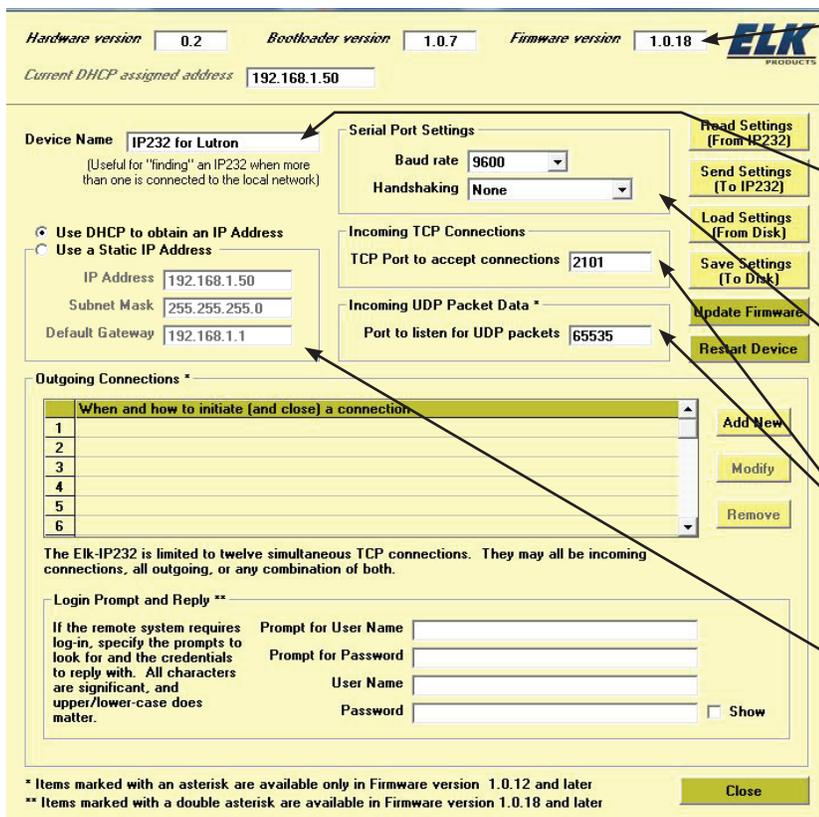


← IMPORTANT: The IP232 Configuration PC Software must be Ver. 1.2.0 or higher.

The IP232 is factory set for DHCP (dynamic) mode whereby it expects to be assigned a non-permanent IP Address from the client's router. DHCP makes it easy to add new devices to a network, however that address may change at some future time. The IP232 can be also assigned to a permanent or STATIC Address. For purposes of interfacing with Lutron the IP232 does not require a STATIC IP Address since it will always be making outgoing connections to the Lutron Homeworks QS Processor. Caution: If the IP232 is unable to obtain a DHCP address from the customer's router, it will fall back to a **STATIC IP Address of: 192.168.0.251**. This address might not be compatible with the customer's network, making it difficult for the Configuration Utility to discover it. Should this occur the most likely problems could be: 1) The client's router is not assigning DHCP addresses, 2) The client's router has reached its limit of available DHCP addresses it can assign, 3) The IP232 may have switched from DHCP mode to STATIC mode. Consult the IP232 manual for steps on how to force the IP232 from STATIC to DHCP mode and vice versa.

The IP232, Lutron Homeworks QS Processor and the PC running the Configuration Utility must each have their own unique IP Address, and each address must be compatible with the Network Subnet Mask and Gateway. For solutions on all of this seek additional help from a knowledgeable network or IT professional.

- 3.3 Once the IP232 is found and displayed in the window, compare the MAC address against the MAC address printed on the label attached to the IP232 to make certain it is the correct IP232.
- 3.4 Click to highlight the found device, then click "Configure" to launch the next screen.



← Firmware version must be 1.0.18 or higher. See IP232 Install manual for steps on updating.

← Program the IP232 with a name such as: **IP232 for Lutron**.

← Set the Serial Port settings to: **Baud rate 9600, Handshaking None**.

← Incoming TCP and Incoming UDP settings are not important for this application.

← Leave the IP232 set to DHCP mode since it is only making an outbound connection to the Lutron Homeworks QS Processor.

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- 3.5 Verify that the Bootloader version is 1.0.7 or higher and that the Firmware version is 1.0.18 or higher. If either of these are older versions it will be mandatory to Update these. The **Bootloader must be Ver. 1.07** or higher and the **Firmware MUST be Ver.1.0.18** or higher in order for the ELK-IP232 to work with the Lutron Homeworks QS Processor.
- 3.6 **Outgoing Connection Rules** - The IP232 must be setup to make an outgoing IP connection to the Lutron Homeworks QS Processor and keep that connection open at all times. If the connection should ever drop the IP232 will automatically reconnect.

TOPOLOGY: ELK-M1 < M1 Databus > ELK-M1XSLU < RS-232 > ELK-IP232 < IP > Lutron Homeworks QS Processor

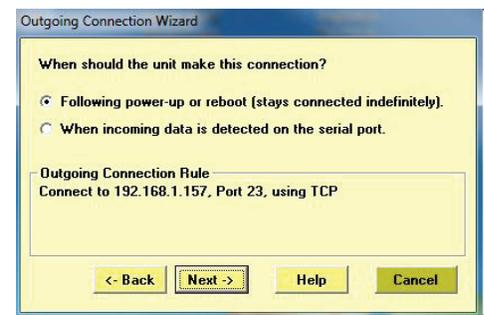
- A. In the Outgoing Connection box click **Add New** to start the rule wizard.
- B. Enter the **IP Address** of the Lutron Homeworks QS Processor. We highly recommend this to be a Static Address so that the IP232 can be permanently programmed with an Address that it can count on to work. Keep in mind that a DHCP Address may change at some future time. If that should happen then a service call would be necessary to reprogram the new Address into the IP232 connection rule!
- ELK strongly recommends setting the Lutron Homeworks QS Processor to a STATIC IP Address.



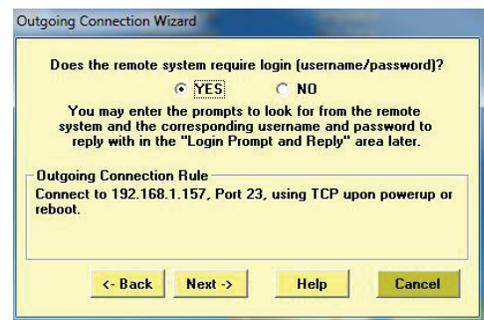
- C. Enter the **Port** as **23**.
- D. Set the connection type as **TCP** then click **Next**.
- E. Q1: When should the unit make this connection?

For instructional purposes ONLY this page shows an IP Address of 192.168.1.157 for the Lutron Homeworks QS Processor.

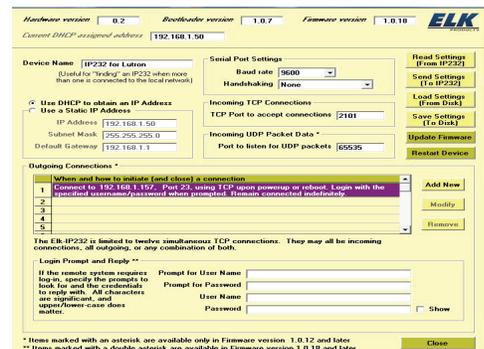
- F. Click: "**Following power-up or reboot (stays connected indefinitely)**"
- G. Click **Next**.



- H. Q2: Does the remote system require Login (username/password)?
- I. Click **YES**
- J. Click **Next**.



- K. Take a moment to review the Outgoing Connection Rule and make sure it looks correct.
- L. When everything is verified and correct click **Done**.



3.7 Login Prompt and Reply - The IP232 has the ability to make a telnet connection that is secured with a Username and Password. This is a requirement for connecting to a Lutron Homeworks QS Processor. The IP232 configuration utility allows full customization of the prompts and the responses for these security challenges.

IMPORTANT: The precise wording of each challenge and response must be known and entered into the spaces provided.

Listed below are the default prompts and responses that were known to be used by Lutron at the time this manual was printed.

Hardware version: 0.2 Bootloader version: 1.0.7 Firmware version: 1.0.18 ELK PRODUCTS

Current DHCP assigned address: 192.168.1.50

Device Name: IP232 for Lutron
(Useful for "finding" an IP232 when more than one is connected to the local network)

Serial Port Settings:
 Baud rate: 9600
 Handshaking: None

Read Settings (From IP232)
 Send Settings (To IP232)
 Load Settings (From Disk)
 Save Settings (To Disk)
 Update Firmware
 Restart Device

Use DHCP to obtain an IP Address
 Use a Static IP Address
 IP Address: 192.168.1.50
 Subnet Mask: 255.255.255.0
 Default Gateway: 192.168.1.1

Incoming TCP Connections:
 TCP Port to accept connections: 2101

Incoming UDP Packet Data *
 Port to listen for UDP packets: 65535

Outgoing Connections *

When and how to initiate (and close) a connection	
1	Connect to 192.168.1.157, Port 23, using TCP upon powerup or reboot. Login with the specified username/password when prompted. Remain connected indefinitely.
2	
3	
4	
5	

 Add New
 Modify
 Remove

The Elk-IP232 is limited to twelve simultaneous TCP connections. They may all be incoming connections, all outgoing, or any combination of both.

Login Prompt and Reply **
 If the remote system requires log-in, specify the prompts to look for and the credentials to reply with. All characters are significant, and upper/lower-case does matter.

Prompt for User Name: login:
 Prompt for Password: password:
 User Name: lutron
 Password: integration Show

* Items marked with an asterisk are available only in Firmware version 1.0.12 and later
 ** Items marked with a double asterisk are available in Firmware version 1.0.18 and later

Close

Below are the Login prompts and the replies shown in BOLD.

For "Prompt for User Name" enter:
login:

For "Prompt for Password" enter:
password:

For "User Name" reply enter:
lutron

For "Password" reply enter:
integration

Note: Password will be hidden unless the Show box is checked.

All characters are lowercase.
 Be sure to include the colon " : " after the login and password entries.

3.8 The completed configuration should look similar to the above with the exception of the actual IP addresses.

3.9 Click **Send Settings (To IP232)** to program all of these settings into the ELK-IP232.

3.10 We suggest saving the configuration to hard disk or a thumbdrive for later retrieval. Click **Save Settings (To Disk)**.

3.11 Click **Close** when done.

Adding Lutron Homeworks QS Lighting Devices to M1

Each Lutron Homeworks QS device must have a unique Device ID. Integrating Homeworks QS lighting devices into M1 involves mapping their Lutron Device IDs to corresponding M1 Light Device numbered locations. Any M1 Light Device locations that do not have a corresponding Lutron Device ID should be left blank (unprogrammed). The steps below outline the programming of M1 Lighting using ElkRP > Automation > Lighting.

4.1 The Lutron Homeworks QS Designer PC software MUST BE USED to setup the Homeworks QS System. THIS IS A REQUIREMENT!

Each device (dimmer, keypad, etc.) will be assigned a unique DEVICE ID. Devices which directly connect to the load may have two IDs assigned to them by the Homeworks QS Designer Software. One ID is associated with the button(s) on the device, while the other ID is associated with the load. M1 can control devices using either ID. After all the devices are added to the network the Homeworks QS Designer software is then used to configure their operation, and to assign any programmed scenes or phantom buttons. Multiple devices can be fluidly controlled together using scenes and phantoms. The primary difference between a scene and a phantom button is that phantom buttons are associated with phantom keypads created within the Homeworks QS Designer software, whereas scenes can be setup to be activated from physical buttons on wall or table mounted keypads.

4.2 The Homeworks QS Designer software provides a **Reports > Integration** menu to view a complete listing of all devices IDs, their names, keypad button assignments (scenes), plus any of the phantom assignments.

4.3 Verify that the M1XSLU is connected to the Homeworks QS Processor.

4.4 Launch ElkRP Software and open or create an account for this job. If this is an existing account file be sure the ElkRP file and M1 Panel are synchronized with the same data. If in doubt, connect to M1 and select **Receive All** to bring all the info from M1 into your ElkRP account file.

4.5 Select the first Homeworks QS Device ID and match it to its M1 Light Device number location. For example, if the Lutron device ID is 7, it should be mapped to M1 light device 7 [A7].

Device	Name	Format	Type	Opt	Show
1 (A1)				<input type="checkbox"/>	<input type="checkbox"/>
2 (A2)				<input type="checkbox"/>	<input type="checkbox"/>
3 (A3)				<input type="checkbox"/>	<input type="checkbox"/>
4 (A4)	Main House	Standard	Other	<input type="checkbox"/>	<input type="checkbox"/>
5 (A5)				<input type="checkbox"/>	<input type="checkbox"/>
6 (A6)				<input type="checkbox"/>	<input type="checkbox"/>
7 (A7)	Living Rm Lamp	Serial Expander *	Dimmer	<input type="checkbox"/>	<input checked="" type="checkbox"/>
8 (A8)	LR Lamp (Out)	Serial Expander *	Dimmer	<input type="checkbox"/>	<input checked="" type="checkbox"/>
9 (A9)	Flood Lights	Serial Expander *	Dimmer	<input type="checkbox"/>	<input checked="" type="checkbox"/>
10 (A10)	Flood Lts (Out)	Serial Expander *	Dimmer	<input type="checkbox"/>	<input checked="" type="checkbox"/>
11 (A11)	Kitchen Spots	Serial Expander *	Dimmer	<input type="checkbox"/>	<input checked="" type="checkbox"/>
12 (A12)	Kt Spots (Out)	Serial Expander *	Dimmer	<input type="checkbox"/>	<input checked="" type="checkbox"/>
13 (A13)	Den Keypad	Serial Expander *	Dimmer	<input type="checkbox"/>	<input checked="" type="checkbox"/>
14 (A14)				<input type="checkbox"/>	<input type="checkbox"/>
15 (A15)	Phantom KP1	Serial Expander *	Dimmer	<input type="checkbox"/>	<input checked="" type="checkbox"/>

NOTE: Any M1 Lighting Device location that does not have a matching Homeworks QS Device ID to be mapped should be left blank (unprogrammed).

4.6 Program a Name (up to 15 characters) describing the location or name of the device.

4.7 Set the Format to "Serial Expander" for all Lutron Devices that are controllable. Note: Lutron assigns Device IDs to almost everything, and some IDs are only rooms or area names which are not controllable devices. To avoid confusion with controllable devices we recommend programming these as Format=Standard and Type=Other.

4.8 Set the Type according to the particular device. (Dimmer or On/Off Switch) Appliance is not applicable.

4.9 DO NOT put a check mark in the Opt. location.

4.10 Put a check mark in the Show box IF the light needs to be displayed on touchscreens or keypads.

4.11 Voice Description is optional. Up to 6 words may be used to provide a spoken description for each light.

4.12 Make sure that ElkRP is connected to the M1 Control and then click **Send to Control** to transfer all of the above programming into the M1.

DISCOVERY MODE: When the M1XSLU is powered up it starts a Discovery Mode to obtain the current status of all existing programmed lighting devices from the Homeworks QS Processor. For this reason, we recommended power cycling the M1XSLU after any programming changes have been made to either the M1 or the Homeworks QS system. Discovery takes approximately ~2 1/4 minutes to complete, during which the status LED will flash rapidly, momentarily stop, and then rapid flash again for about ~16 seconds. (the 2nd rapid flash will only occur if a <TS thermostat status is sent by the M1. **Please wait until the M1XSLU Discovery Mode is complete. DO NOT TOUCH OR DISTURB anything until the rapid flashing changes to a slow 1 sec. flash.**

Controlling Homeworks QS Lights and Devices using Rules

- 4.13 Select **EIKRP > Automation > Rules**.
- 4.14 Click **New** to start a new Rule. E.G. Turn ON a Flood Light when the System is Armed Away.
- 4.15 Click **WHENEVER > Security/Alarms > Is Armed > Armed Away**. A pop-up box appears to pick the Area (partition). Use the drop down to pick the area or Click OK to accept "Area 1".
- 4.16 Click **THEN > Control Lighting > Individual**. A new box will appear.
- 4.17 In the Select lighting device box scroll and select one of the Lights. E.G. Flood Lights [9 (A9)].
- 4.18 Click **Turn On** followed by **OK**. The screen should resemble the first two lines in the illustration below.
- 4.19 Repeat for additional lights and then click **DONE** to complete the Rule.
- 4.20 Make sure that EIKRP is connected and on-line with the M1 Control, then click **Send to Control**.

The screenshot displays the 'Lighting' configuration window. On the left is a 'Folder Items' tree. The main area shows a table of devices:

Device	Name	Format	Type	Opt	Show
1 (A1)					
2 (A2)					
3 (A3)					
4 (A4)	Main House	Standard	Other		
5 (A5)					
6 (A6)					
7 (A7)	Living Rm Lamp	Serial Expander *	Dimmer		<input checked="" type="checkbox"/>
8 (A8)	LR Lamp (Out)	Serial Expander *	Dimmer		<input checked="" type="checkbox"/>
9 (A9)	Flood Lights	Serial Expander *	Dimmer		<input checked="" type="checkbox"/>
10 (A10)	Rules				
11 (A11)					
12 (A12)					
13 (A13)					
14 (A14)					
15 (A15)					

The 'New Rule' dialog box shows the following configuration:

- Rule:** WHENEVER Smith Household (Area 1) IS ARMED AWAY THEN TURN Flood Lights [9 (A9)] ON, FADE RATE = 0 FOR 30 SECS
- Then Operands:** Change Lighting, Select lighting device: Flood Lights [9 (A9)], Turn on, Duration: 0:00:30

This rule turns the Flood Lights ON for 30 seconds. They should turn OFF automatically 30 secs. after arming and leaving the building.

Then Operands are Turn Off, Turn On, Toggle (flip/flop), and Set to Level (Dim). Note: Dim levels are also used for virtual button presses on Keypads. See page 13.

Fade Rate (Ramp) - A dimmer device can be set to fade On/Off over a time period. Settings are: 0=none, 1=2 Secs, 2=4 Secs, 3=8 Secs, 4=16 Secs, 5=32 Secs, 6=46 Secs NOTE: Fade Rate 7 has some unique functionality. See page 13 & 14 for details.

For (Duration) - Allows a duration to be set for the light, after which it will revert back to its previous state. Duration can be Days, Hrs, Min, Sec, or a Custom Setting selection.

Note: Percent % (dim) values 2 thru 20 @ Fade Rate=0 and Fade Rate=7 are reserved. This means it is not possible to directly control a Homeworks QS Dimmer to % (dim) values 2 thru 20 UNLESS the Fade Rate is set to a value of 1, 2, 3, 4, 5, or 6. The drawback is that setting a Homeworks QS Dimmer to dim level 1 thru 20 cannot be immediate. Rather it will be slightly delayed by the value programmed as the Fade Rate.

Fade Rate 0 = No fade or ramp	Fade Rate 4 = Light(s) will fade (ramp) on over a 16 seconds
Fade Rate 1 = Light(s) will fade (ramp) on over a 2 seconds	Fade Rate 5 = Light(s) will fade (ramp) on over a 32 seconds
Fade Rate 2 = Light(s) will fade (ramp) on over a 4 seconds	Fade Rate 6 = Light(s) will fade (ramp) on over a 46 seconds
Fade Rate 3 = Light(s) will fade (ramp) on over a 8 seconds	

Adding Lutron TouchPro Wireless Thermostats to M1

Lutron's TouchPro Wireless HVAC Thermostats are compatible with the Lutron Homeworks QS system. The M1XSLU can interface with up to sixteen (16) of these thermostats, but special steps are needed due to the architecture of the equipment. 1. Only Device IDs below 100 (2 digits) may be used for HVAC Thermostats. 2. The M1 has to initialize the M1XSLU with the Device ID (2 digit) of each HVAC Thermostat. This is done by having the M1 send a special text string command <TS to the M1XSLU followed by a two (2) digit Device ID for each Thermostat. The M1XSLU takes this and maps each to an M1 Thermostat location (1-16).

The Lutron Homeworks QS Designer PC Software is required to setup the Lutron HVAC Thermostats and to assign each one a unique Device ID. This software also provides a means to view ALL of the installed Device IDs. The ElkRP PC software and Automation Rules programming is required to setup the M1XSLU and to create the text strings and rules for sending the Device IDs of the HVAC Thermostats. Please follow each of the steps below.

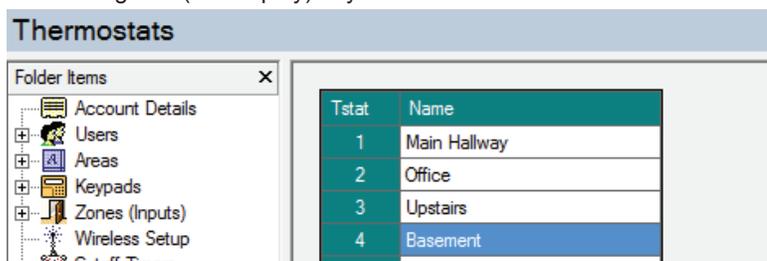
NOTE: On power-up the M1XSLU performs a Discovery Mode (~ 2 1/4 minutes) to obtain the status for all lighting devices. When complete the M1XSLU will send text string <DE^M (Discovery End). In order to set up Thermostats two (2) ElkRP rules must be written. The first is used to detect the <DE^M string and start a delay timer. The next will execute when the delay timer expires and send text string <TS along with the Device IDs of each Thermostat. See Steps 4.4 & 4.5

5.1 Use the Lutron Homeworks QS Designer PC software to setup the Homeworks QS System. THIS IS A REQUIREMENT! During setup each device (Controller, Dimmer, Keypad, HVAC Thermostat) will be assigned a unique Device ID. Refer to the Reports > Integration menu to view a listing of these device ids, including the HVAC Thermostats and use this information to fill-in the ID of each Lutron HVAC Thermostat in the spaces below. **HVAC Thermostats may only reside at IDs below 100.**

1st Thermostat ID = ___ 2nd= ___ 3rd= ___ 4th= ___ 5th= ___ 6th= ___ 7th= ___ 8th= ___
9th Thermostat ID = ___ 10th= ___ 11th= ___ 12th= ___ 13th= ___ 14th= ___ 15th= ___ 16th= ___

5.2 Launch ElkRP Software and open or create an account for this job. If using a previously programmed account, make sure the ElkRP file and M1 Panel are synchronized with the same data. If in doubt, connect to M1 and select Receive All to bring all the info from M1 into your ElkRP account file.

5.3 Click > Automation > Thermostats and program a descriptive name for each Thermostat that is being integrated. A NAME IS MANDATORY. M1 will ignore (not display) any Thermostat location that does not have a name.

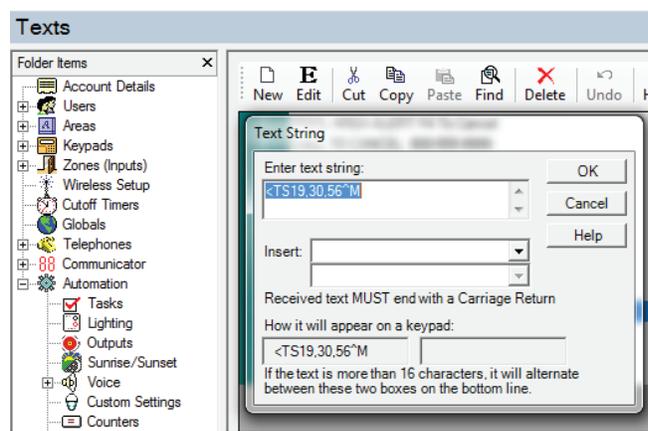
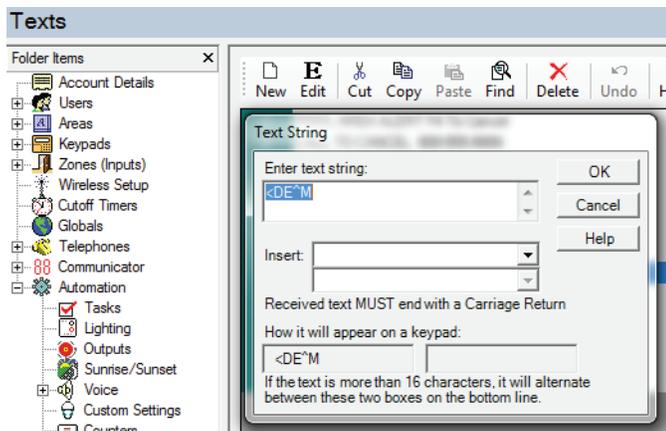


4.4 Click > Automation > Texts and program 2 new text strings. As mentioned, the texts strings will be used in Automation Rules to: 1)Detect the end of Discovery Mode and 2)Send the Thermostat Device IDs to the M1XSLU.

Click **New** to create the 1st text string. Enter the first text string as: <DE^M then click OK.

Click **New** to create the 2nd text string. Start this string with <TS and follow with the Device ID of the first thermostat (refer to step 4.1). In the case of multiple thermostats separate each Device ID with a comma ",". End the string with a ^M. An example of a text string for 3 thermostats numbered 19,30, & 56 would be <TS19,30,56^M Click OK when done.

NOTE: Each ID entry after <TS MUST BE TWO (2) DIGITS. e.g 01 to 09, 10, etc. 1 thru 9 will not work.

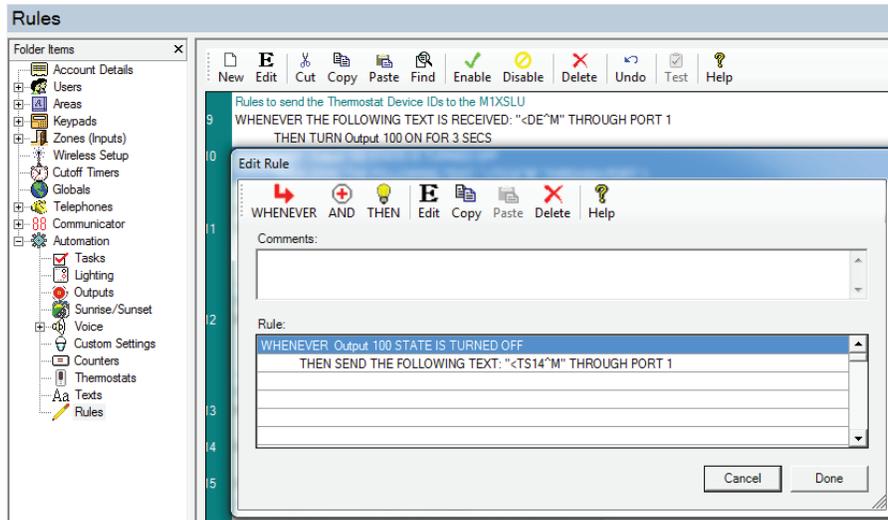


LUTRON HOMEWORKS QS

5.5 Select **EikRP > Automation > Rules** and program 2 rules using the following examples. These rules incorporate a virtual Output as a timer or "Flag" to delay the sending of the TS command by 3 seconds. Any unused output may be substituted for the flag. It DOES NOT have to be a real output or one attached to an output expander. Three (3) seconds after the virtual output turns off the second rule will send the TS command and contents to the M1XSLU. Substitute your Thermostat Device (2 digit) IDs. Use the enrolled data bus address of the M1XSLU for the Port "X".

WHENEVER THE FOLLOWING TEXT IS RECEIVED: "<DE^M" THROUGH PORT X (address of M1XSLU)
THEN TURN [ANY AVAILABLE OUTPUT] ON FOR 3 SECS

WHENEVER [OUTPUT USED IN ABOVE RULE] IS TURNED OFF
THEN SEND THE FOLLOWING TEXT: "<TS19,30,56^M" THROUGH PORT X (address of M1XSLU)



Click **OK** and then **Send** the new rule and all the other programming from EikRP to the M1 Control.

5.6 Verify that the M1XSLU is connected to M1 Data Bus and also the Homeworks QS Processor.

5.7 Power cycle or power-up the M1XSLU to start the Discovery Mode. Discovery takes ~2 1/4 minutes to complete, during which the status LED will flash rapidly, momentarily stop, and then rapid flash again for about ~16 seconds. This second flashing indicates the M1XSLU has received the <TS command from M1. Please wait until the M1XSLU Discovery Mode is complete. I.E. DO NOT DISTURB until the rapid flashing changes to a slow 1 sec. flash.

LIMITATIONS: Lutron TouchPro Wireless HVAC Thermostats CANNOT BE MIXED (combined) with other HVAC Thermostat technologies or brands on the same job. I.E. Do not mix hardwired units such as RCS RS485, Leviton RS232, or Aprilaire RS485 on the same M1 panel with Lutron TouchPro Wireless HVAC Thermostats. If Lutron HVAC Thermostats are mixed with hardwired thermostat units on the same installation then NO DATA will be displayed for the Lutron units.

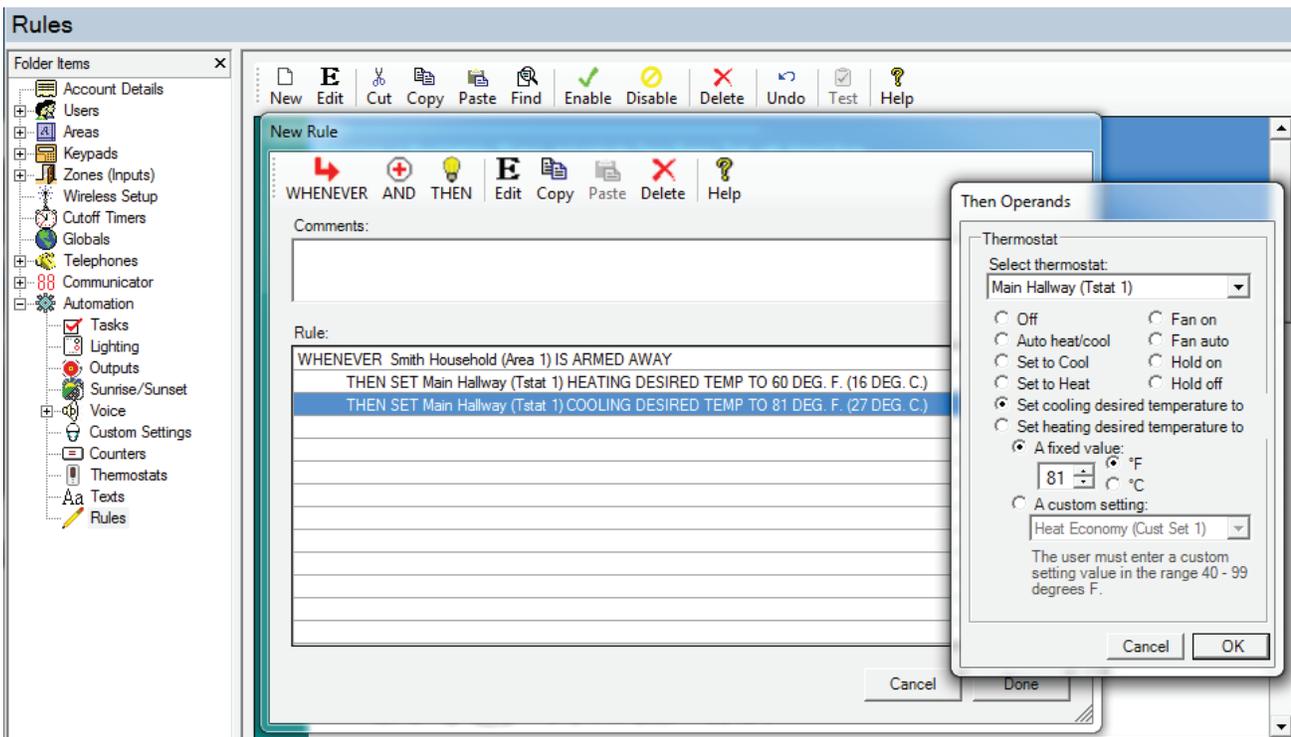
Q - Will the order or appearance of M1 Thermostats be affected if Lutron Thermostats are removed or replaced?

A - The sort order is directly related to the Lutron device ID assignments and the order these are sent to the M1XSLU using the <TS text string. Therefore, should a thermostat be removed or replaced by a new ID then the M1 and Homeworks QS will be OUT OF SYNC. There are two ways to repair this situation: 1) If a thermostat is permanently removed then edit the <TS text string and remove the Device ID of the removed unit. 2) If a thermostat is replaced because of a defect, etc. then use the Homeworks QS Designer PC software to make sure the replacement thermostat is assigned the Device ID that belonged to the old thermostat (the one it replaced).

IMPORTANT! We strongly recommend that each HVAC Thermostat be tested after any changes are made to Eik-M1 or the Lutron Homeworks QS network. Verify that each is communicating and responding properly. Test all EikRP Rules that involve a Thermostat. Verify that all keypads, touchscreens, or software interfaces are properly displaying the: 1) Mode i.e. Auto, Heat, Cool, or Aux., 2) Current Temperature, 3) Heat Setpoint, 4) Cool Setpoint, 5) Fan Mode

Controlling TouchPro Wireless HVAC Thermostats using Rules

- 5.8 Select **EIKRP > Automation > Rules**.
- 5.9 Click **New** to start a new Rule. Example: Lower the Heat and Raise the Cool Setpoints when Armed.
- 5.10 Click **WHENEVER > Security/Alarms > Is Armed > Armed Away**. A pop-up box appears to pick the Area (partition). Use the drop down to pick the area or Click OK to accept "Area 1".
- 5.11 Click **THEN > Thermostat**. A new box will appear.
- 5.12 In the Select Thermostat box scroll and select one of the Thermostats. E.G. Main Hallway [Tstat 1].
- 5.13 Click **Set heating desired temperature to**.
- 5.14 In the value box scroll to set the temperature value. Set the F or C box to your preference. Then click **OK**. The screen should resemble the first two lines in the illustration below.
- 5.15 To set the Cooling setpoint click **THEN > Thermostat**.
- 5.16 Select the same Thermostats. E.G. Main Hallway [Tstat 1] as before.
- 5.17 Click **Set cooling desired temperature to**.
- 5.18 In the value box scroll to set the temperature value. Set the F or C box to your preference. Then click **OK**. The screen should resemble the first three lines in the illustration below.
- 5.19 Click **DONE** to complete this Rule.
- 5.20 Make sure that EIKRP is connected and on-line with the M1 Control, then click **Send to Control**.



Rule Examples and Advanced M1XSLU Options

Below are examples of Elk-RP Rules being used to control Lights and Thermostats.

- 1 **Rule to turn on flood light for 30 secs. and activate Save Energy Task with Armed Away**
 WHENEVER Smith Household (Area 1) IS ARMED AWAY
 THEN TURN Flood Lights [9 (A9)] ON, FADE RATE = 0 FOR 30 SECS
 THEN ACTIVATE Save Energy (Task 8)

- 2 **Rule defines Task "Save Energy" to active a Phantom Keypad scene and setback HVAC to save \$\$\$**
 WHENEVER Save Energy (Task 8) IS ACTIVATED
 THEN SET Phantom KP1 [15 (A15)] TO 2% BRIGHT, FADE RATE = 7
 THEN SET Main Hallway (Tstat 1) HEATING DESIRED TEMP TO 60 DEG. F. (16 DEG. C.)
 THEN SET Main Hallway (Tstat 1) COOLING DESIRED TEMP TO 81 DEG. F. (27 DEG. C.)

- 3 **Rule to activate "Welcome Home" task upon disarm**
 WHENEVER Smith Household (Area 1) ARM STATE BECOMES DISARMED
 THEN ACTIVATE Welcome Home (Task 1)

- 4 **Rule defines task "Welcome Home" to turn on various lights and adjust thermostat setpoints**
 WHENEVER Welcome Home (Task 1) IS ACTIVATED
 THEN SET Flood Lights [9 (A9)] TO 60% BRIGHT, FADE RATE = 0
 THEN SET Living Rm Lamp [7 (A7)] TO 40% BRIGHT, FADE RATE = 0
 THEN SET Kitchen Spots [11 (A11)] TO 40% BRIGHT, FADE RATE = 0
 THEN SET Main Hallway (Tstat 1) HEATING DESIRED TEMP TO 68 DEG. F. (20 DEG. C.)
 THEN SET Main Hallway (Tstat 1) COOLING DESIRED TEMP TO 72 DEG. F. (22 DEG. C.)

Rule 1 - Turns Flood Lights on for 30 secs. and activates Save Energy Task* when Armed Away.

Rule 2 - Task* "Save Energy" activates a Phantom Keypad button 2 and sets back HVAC Thermostat to save \$\$.

NOTE: Phantom Keypads allow Groups or Scenes to be activated by a Set to Level command. In this rule the 2% Bright activates Phantom button #2. See "**Phantom Keypads**" for more info.

Rule 3 - Upon Disarm the Task "Welcome Home" is activated.

Rule 4 - Task* "Welcome Home" turns on some lights and sets HVAC to 68 & 72 deg.

*NOTE: Tasks are like macros and can be handy for optimizing or saving rule space. The same task can be activated by any of several rules and conditions.

Button Presses

Buttons on Homeworks QS Wall or Tabletop Keypads, and Visor Ctrl Receivers may be programmed to activate Groups of lights (Scenes) with a single press. To permit M1 to activate these buttons, Elk reserved the use of "Set to Level" and Fade Rate 7 to activate special commands to the M1XSLU. To activate a particular button on a device, create a rule to set the level of the that device to match the button number with Fade Rate 7. See the examples below. As a result, the M1 cannot set a Homeworks QS Dimmer to Dim Levels UNLESS the Fade Rate is set as 1,2,3,4,5,or 6.

Rule defines task "Watch TV" which presses a Scene Button #3 on Device #13, a Homeworks QS HQR-T10RL
 WHENEVER Watch TV (Task 4) IS ACTIVATED
 THEN SET Den Keypad [13 (A13)] TO 3% BRIGHT, FADE RATE = 7

Buttons on Pico Wireless Controls may also be programmed to activate Groups of lights (Scenes). M1 can activate these buttons by also using "Set to Level" and Fade Rate 7 commands. However the button numbering for Pico controls is offset by 1. For example, to activate button 1 on the Pico control, create the rule to set the Pico device ID to level 2, Fade Rate 7. See example below.

Rule to activate button 1 on Pico Wireless Control, when F5 is pressed on any keypad
 WHENEVER F5 KEY ON ANY KEYPAD ACTIVATES
 THEN SET Pico Wireless [17 (B1)] TO 2% BRIGHT, FADE RATE = 7

M1 rules can be triggered in response to button presses on a wall or tabletop keypad, providing a method to control outputs, tasks, etc. when a button is pressed on the Homeworks QS device. This is achieved using the "is set to level" option in rules. See example below.

Rule reacts to a button press (#5) on a tabletop keypad (device #13) to trigger a relay output to control the garage door
 WHENEVER Den Keypad [13 (A13)] IS SET TO LEVEL 5%
 THEN TURN Garage Door (Out 9) ON FOR 2 SECS

Note: It may be possible to trigger rules based on a button release. This functionality may require specific settings for the button in the Lutron QS Designer software and may not be supported by all devices. Reference the Lutron Integration Protocol for complete details.

Phantom Keypads

The Homeworks QS Designer PC Software allows for the configuration of Phantom Keypads. "Buttons" on these phantom keypads can be programmed to active groups of lights (scenes). M1 can activate these "buttons" through rules, using set to levels 1 to 99 with Fade Rate 7. See the examples below. M1 can activate up to 99 "buttons" or scenes for each phantom keypad.

Rule defines Task "Save Energy" to active a Phantom Keypad scene and setback HVAC to save \$\$\$

```
WHENEVER Save Energy (Task 8) IS ACTIVATED
    THEN SET Phantom KP1 [15 (A15)] TO 2% BRIGHT, FADE RATE = 7
    THEN SET Main Hallway (Tstat 1) HEATING DESIRED TEMP TO 60 DEG. F. (16 DEG. C.)
    THEN SET Main Hallway (Tstat 1) COOLING DESIRED TEMP TO 81 DEG. F. (27 DEG. C.)
```

Rule activates button #10 on a Phantom keypad (Device # 15) to flash a group of lights when the burglar alarm turns on

```
WHENEVER THE BURGLAR ALARM IN Smith Household (Area 1) TURNS ON
    THEN SET Phantom KP1 [15 (A15)] TO 10% BRIGHT, FADE RATE = 7
```

Rule activates button #11 on a Phantom keypad (Device # 15) to turn on a group of lights when the burglar alarm cuts off

```
WHENEVER THE BURGLAR ALARM IN Smith Household (Area 1) CUTS OFF
    THEN SET Phantom KP1 [15 (A15)] TO 11% BRIGHT, FADE RATE = 7
```

Loss/Restoral of Connectivity Homeworks QS Processor

Using custom text strings and rules, it is possible to provide notification of a loss/restoral of supervision of the Homeworks QS Processor. The rule examples below use both email notification and keypad text alerts.

Rule sends email notification and displays trouble message on keypad if supervsion with Lutron QS Processor is lost

```
WHENEVER THE FOLLOWING TEXT IS RECEIVED: "<LOSS^M" THROUGH PORT 1
    THEN SEND EMAIL MESSAGE 14 TO manager@hometechpro.biz (Email 14)
    THEN DISPLAY "Lutron Trouble Call for Service" IN Smith Household (Area 1) INDEFINITELY. [*] CLEARS
```

Rule sends email notification and clear previously displayed message when supervision wth Lutron QS Processor is restored

```
WHENEVER THE FOLLOWING TEXT IS RECEIVED: "<REST^M" THROUGH PORT 1
    THEN SEND EMAIL MESSAGE 15 TO manager@hometechpro.biz (Email 15)
    THEN CLEAR PREVIOUSLY DISPLAYED MESSAGES ON KEYPADS IN Smith Household (Area 1)
```

TABLE 5: M1 and M1XSLU TEXT Strings

TEXT String	Transmitted Strings (M1 to M1XSLU) and their application
<POLL^M	Can be sent to the M1XSLU to manually activate the Discovery Mode which gathers all the latest lighting status from the processor. This ordinarily activates only upon power application. While it is unlikely that this command will ever be needed, it does allow Discovery Mode to be activated without the need of powering down the M1XSLU.
<TSxx^M	This string is VERY IMPORTANT if Lutron TouchPro Wireless HVAC Thermostats are to be integrated with M1. It is used to send the Device IDs of each thermostat to the M1XSLU. This allows the M1XSLU: 1) To know the ID of each existing Lutron thermostat. 2) To query the status of each and to map the data response to the appropriate M1 Thermostat locations (1-16). The mapped order is dependent on the order of the IDs sent by <TS^M string sent to the M1XSLU. E.G. Say there were 3 Lutron thermostats and their Device IDs are 19, 30, & 56. The string to be sent would be: <TS19,30,56^M Device ID19 will be M1 Thermostat 1, ID30 will be M1 Thermostat 2, and ID56 will be M1 Thermostat 3.
Received ONLY Strings (M1XSLU to the M1) and their application	
<DE^M	The M1XSLU will transmit <DE^M to the M1 whenever the power-up Discovery Mode ends. The current application for this is to determine when it is appropriate for the M1 to send the thermostat status command <TS^M. Two Automation Rules should be written, one to receive the <DE^M and turn on a delay flag (E.G. Output x On for 3 sec.), and a second one to send the <TS^M string. E.G. WHENEVER <DE^M Received on Port x THEN SEND <TS^M on Port x.
<LOSS^M	The M1XSLU supervises its connection to the QS Processor by querying every 30 seconds. If the QS Processor fails to respond 3 consecutive times the M1XSLU will transmit <LOSS^M to the M1. This can be used to create a trouble alert or relay activation by writing an Automation Rule that looks for this received string. E.G. WHENEVER [Text String] <LOSS^M Received on Port x THEN [do something] Turn On an Output, etc.
<REST^M	This is for use to clear any trouble set by the <LOSS^M string above. Once the M1XSLU receives a valid response from the QS Processor it will transmit <REST^M to the M1. An Automation Rule that looks for this received string will be required. E.G. WHENEVER [Text String] <REST^M is Received on Port x THEN [do something] Turn Off an Output, etc.