
RadioRA®



Wireless Central Lighting Control

RA-RS232, RB-RS232

Setup and Installation Guide Addendum For RadioRA® RS232 Interface

A Comprehensive Step-by-Step Guide for Programming
and Operating the Lutron® RadioRA® RS232 Interface

Note: Please leave this manual with homeowner.

LUTRON®

Notes on this Manual

This manual is an addendum to the original RadioRA® Setup Guide. The procedures to setup a RadioRA® RS232 Interface are contained in this manual. For more information on programming the remainder of your RadioRA® System, or for advanced features, refer to the original RadioRA® Setup Guide (P/N 044-001).

Important Application Notes

1. The RS232 Interface is a type of Master Control. The System can have a maximum of 12 Master Controls. Therefore, for every 1 Master Control NOT used, 1 RS232 Interface may be used in its place.
2. ALL ON is Phantom Button 16 and ALL OFF is Phantom Button 17.

Consumer Information



This symbol is intended to alert the user to the presence of important installation and operating instructions.

Danger

This RadioRA® system must not be used to control equipment, other than lighting, which is not visible from every master or local control location. It also must not be used to control equipment which could create hazardous situations such as entrapment if operated accidentally. Examples of equipment which must not be controlled by this RadioRA® system include (but are not limited to) motorized gates, garage doors, industrial doors, and microwave ovens, heating pads, etc. It is the installer's responsibility to ensure that the equipment, other than lighting, being controlled is visible from every master or local control location and that only suitable equipment is connected to this RadioRA® system.

FCC Information

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Caution: Changes or modifications not expressly approved by Lutron Electronics Co. could void the user's authority to operate this equipment.

Table of Contents

Section 1 - Installation

<i>Installing an RS232 Interface</i>	
Installation	4
<i>Overview of the RS232 Interface</i>	
Overview	6
Definitions of Common Terms	7

Section 2 - Start-Up

<i>Adding an RS232 Interface</i>	
Activating an RS232 Interface	8
<i>Programming Preparations</i>	
RS232 Programming Worksheet	10
Assigning Phantom Buttons as ROOMS or SCENES	12
<i>Phantom ROOM Button Programming</i>	
Assigning Dimmers, Switches or GRAFIK Eye Control Units to Phantom ROOM Buttons	14
Setting Light Levels/GRAFIK Eye SCENE Selection for Phantom ROOM Buttons	17
<i>Phantom SCENE Button Programming</i>	
Assigning Dimmers, Switches or GRAFIK Eye Control Units to Phantom SCENE Buttons	20
Setting Light Levels/GRAFIK Eye SCENE Selection for Phantom SCENE Buttons	23

Section 3 - Advanced Features

<i>Advanced Programming</i>	
Assigning Zone Numbers	26
Assigning Master Control Numbers	29
Turning Hardware Handshaking ON or OFF	33
Copying Button Programming from a Master Control or an RS232 Interface to an RS232 Interface	35
Copying Button Programming from an RS232 Interface to a Master Control	38
Erasing Phantom Button Programming	40

Section 4 - Operation

<i>Operation</i>	
Toggling a Phantom Button ON or OFF Locally	42
Feedback During Normal Operation	43

Section 5 - Troubleshooting

<i>Troubleshooting Guide</i>	44
<i>Returning to Default Factory Settings</i>	
RS232 Interface	46
<i>Master Control Number Worksheet</i>	47

Installing an RS232 Interface

Installation

Read all instructions completely before installation.

Important Installation Notes

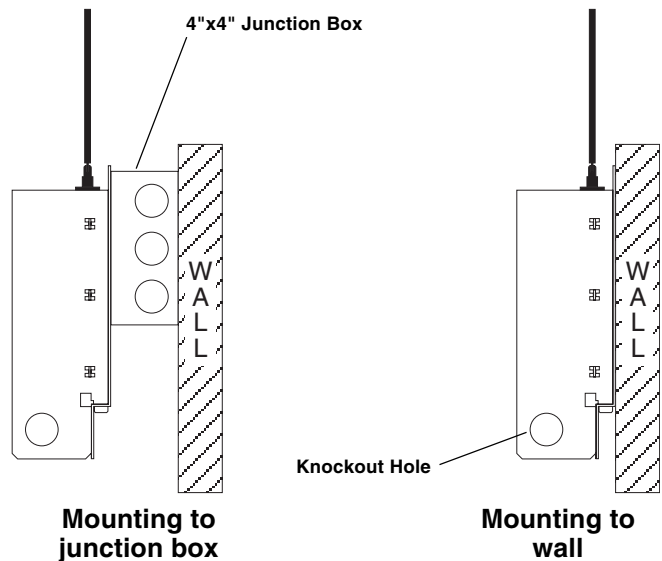
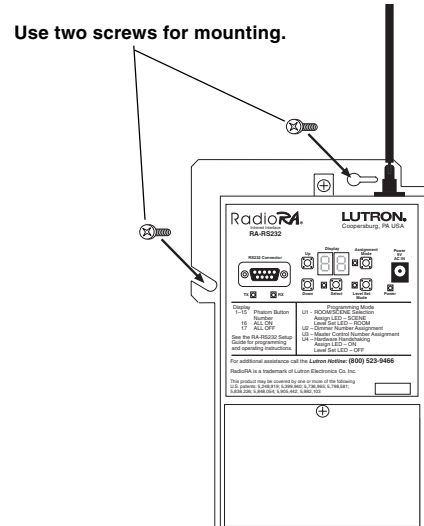
1. Install in accordance with all national and local electrical codes.
2. Do not paint the RS232 Interface.
3. Operate in ambient temperatures between 0°C (32°F) and 40°C (104°F).
4. Use only the AC adapter provided by Lutron with your RS232 Interface unit. Using an AC adapter not rated at the following specifications could damage the control and possibly overheat the AC adapter.
 - Input: AC 120V 60Hz
 - Output: AC 9V/500mA Class 2
5. The range and performance of the RadioRA System is highly dependent on a variety of complex factors such as:
 - Distance between system components
 - Geometry of the home
 - Construction of walls separating system components
 - Electrical equipment located near system components

Step 1 Find a suitable location for the RS232 Interface

Place the RS232 Interface in a convenient and accessible location. **Note:** RS232 Interface must be located within 30 feet of a Repeater.

Step 2 Mount the RS232 Interface

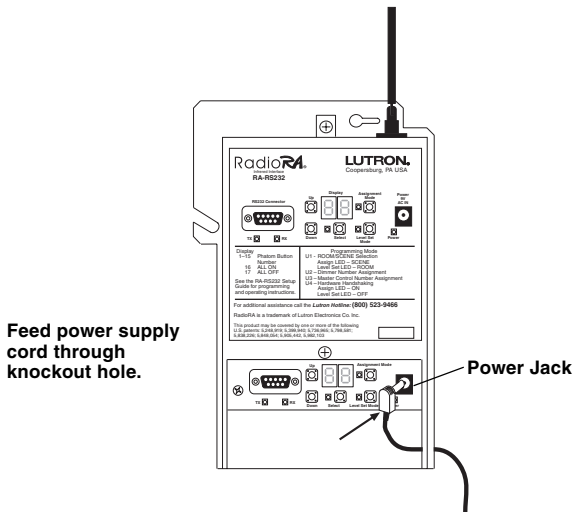
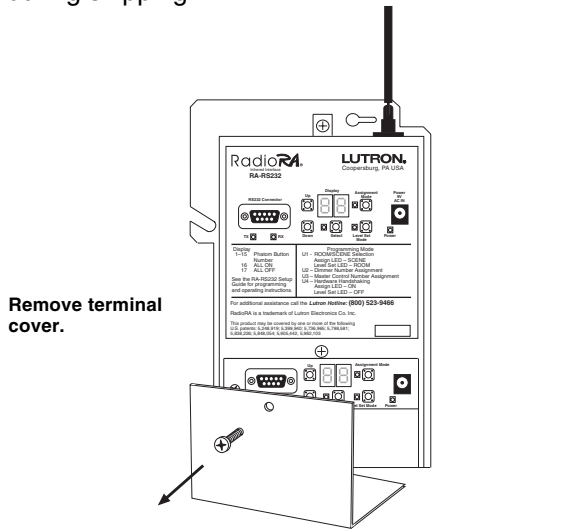
Using two screws, mount the RS232 Interface to a 4"x4" junction box or directly to a wall (screws and wall anchors provided).



Installing an RS232 Interface

Step 3 Attach the power supply

Remove terminal cover. Attach the power supply cord to the RS232 Interface (jack located in the bottom right corner). Power supply cord must enter unit through a knockout hole located on either side of the unit. Place the provided grommet in the knockout hole before wiring. **Note:** Terminal cover is only necessary during shipping.

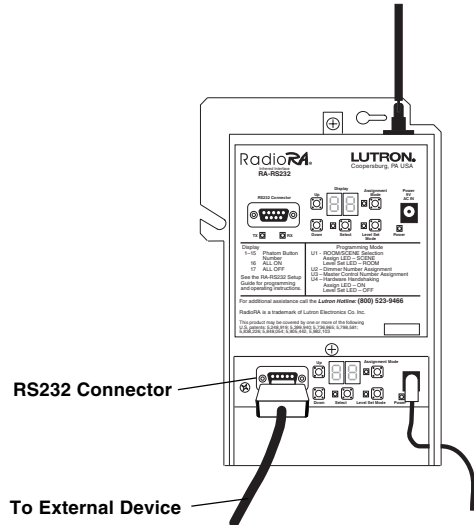


DANGER -

- Do not connect line voltage power to the RS232 Interface.
- Connecting line voltage power or improper wiring can result in personal injury or damage to the control or to other equipment.

Step 4 Connect the RS232 cable

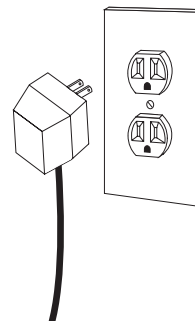
Connect a DB-9 male RS232 cable to the RS232 connector.



To select the proper RS232 cable for your application, see the RadioRA RS232 Protocol and Programming Guide (P/N 044-006).

Step 5 Plug in the power supply

Plug the power supply into a 120VAC, 60Hz wall receptacle.



Overview of the RS232 Interface

Overview

This manual contains information on how to setup and install an RS232 Interface. The RadioRA® RS232 Protocol and Programming Guide (P/N 044-006) contains information regarding the RS232 command set and how to interface the RS232 Interface with equipment external to the RadioRA® System.

The RS232 Interface allows an external device to control RadioRA® lighting loads and provides an external device with feedback of RadioRA® activity. Depending on your application, Phantom Buttons, Zone Numbers, or Master Control Numbers may not have to be assigned.

Phantom Buttons must be assigned to have an external device:

- Activate Phantom Buttons 1 – 15, ALL ON (Phantom Button 16), or ALL OFF (Phantom Button 17).
- Monitor the status of Phantom LEDs 1 – 15.
- Raise or Lower Phantom Buttons 1 – 15. *

Zone Numbers must be assigned to have an external device:

- Individually control a zone.
- React when a zone is changed locally.

Master Control Numbers must be assigned to have an external device:

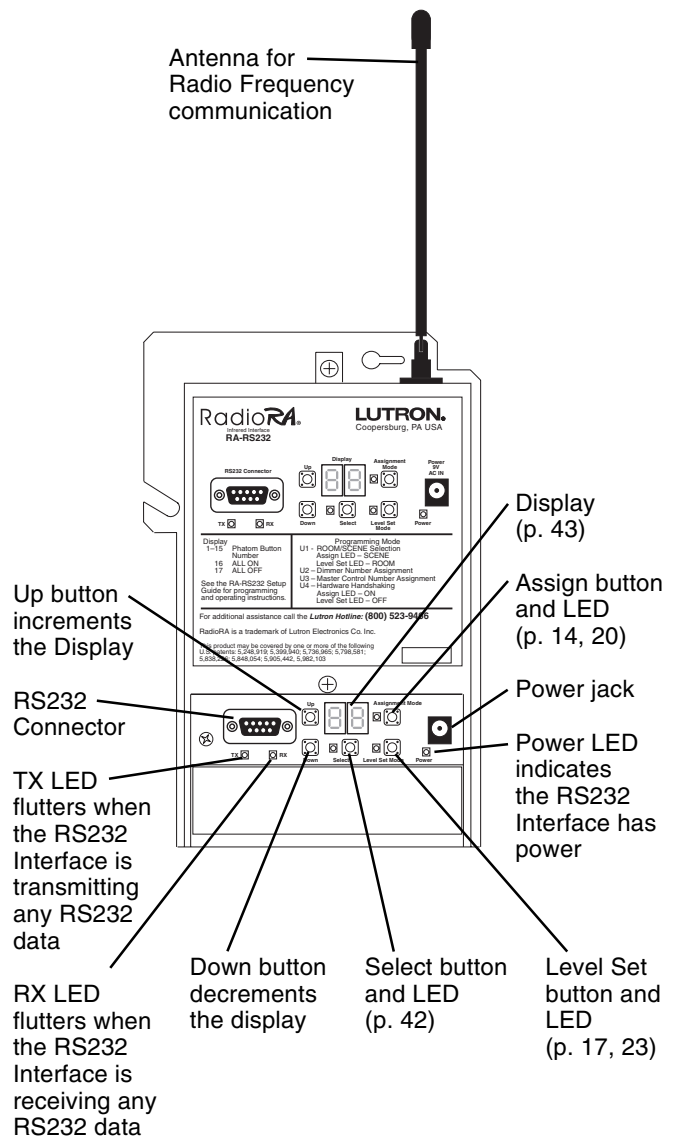
- React when a Master Control button is pressed.
- Control the LED of a Master Control button which has no RadioRA® loads assigned to it.
- React when a Raise/Lower button is pressed on a Master Control. *
- React when a Cordless Master Control wakes up or goes to sleep. *

* Only applies to RS232 Interfaces Lutron shipped after August 1, 2001



NOTE: RS232 Interface will not operate until it has been programmed.

- After 10 minutes with no button presses, the display will turn OFF. To restore the display, press and release any button on the RS232 Interface or send an RS232 command.
- Restore the display on the RS232 Interface before starting any programming steps in this guide.



Overview of the RS232 Interface

Definitions of Common Terms

Delay Time - The time a switch will wait before it goes to the desired state.

Fade Time - The time it takes a dimming device to reach its goal level.

Master Control - A RadioRA® Master Control is a system control point that provides control of lights throughout a home. Master Controls can be wall mounted, tabletop, or cordless. Other system Master Controls are the Switch Closure Interface, the Infrared Interface, or another RS232 Interface.

Master Control Number - Master Control Numbers are used to identify RadioRA® Master Controls via the RS232 Interface.

Phantom Buttons - Phantom Buttons are “virtual” buttons in the RS232 Interface. Though there are no physical buttons that represent these Phantom Buttons, they work very similarly to buttons on RadioRA® Master Controls. Each Phantom Button can be assigned either as a ROOM or SCENE.

Phantom LEDs - Phantom LEDs are “virtual” LEDs in the RS232 Interface. Though there are no physical LEDs that represent these Phantom LEDs, they work very similarly to LEDs on RadioRA® Master Controls. Phantom LEDs 1–15 are associated with Phantom Buttons 1–15, respectively.

ROOM Button - A ROOM button is a programmable button whose LED is ON when any lighting zone assigned to that button is ON at any level. When issuing an “ON” command, a ROOM button may only turn zones ON, not OFF.

SCENE Button - A SCENE button is a programmable button whose LED is ON when the SCENE associated with that button has been activated. The LED will go out when the light zone changes level or receives a command to change level, even if the new level is the same as its preset level. The LED will also go out if the SCENE is turned OFF. When issuing an “ON” command, a SCENE button may turn zones ON or OFF.

Zone - A zone is any individual RadioRA® Dimmer, Switch, or GRAFIK Eye® Interface. A RadioRA® System has a maximum of 32 zones.

Zone Number - Zone Numbers can be used to identify any individual zone (one Dimmer, Switch, or GRAFIK Eye® Interface) in your RadioRA® System via the RS232 Interface.

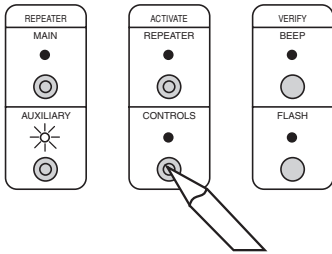
Adding an RS232 Interface

Activating an RS232 Interface

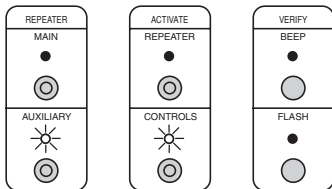
The RS232 Interface is a type of Master Control. The RadioRA System can have a maximum of 12 Master Controls. Therefore, for every 1 Master Control NOT used, 1 RS232 Interface may be used in its place.

Step 1 Begin RS232 Interface activation

Press and hold the ACTIVATE CONTROLS button on **any** Repeater until the green ACTIVATE CONTROLS LED turns ON (approximately 3 seconds).



The green ACTIVATE CONTROLS LED on **ALL** Repeaters will turn ON.

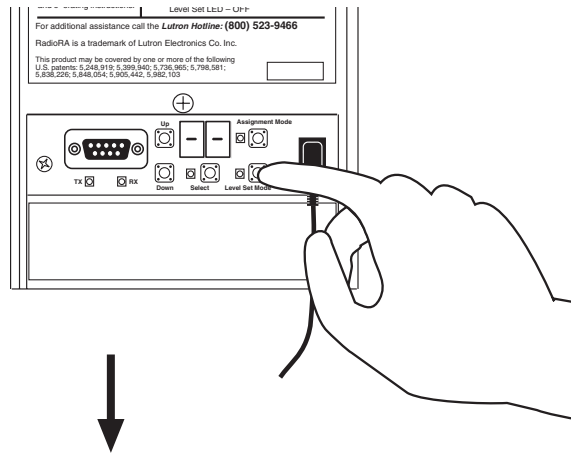



Step 2 Activate RS232 Interface

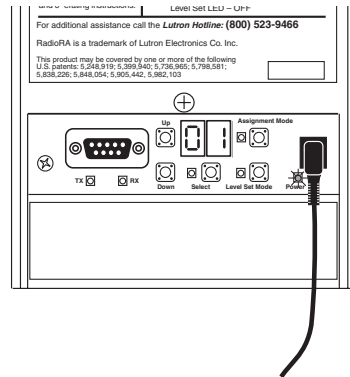
Note: Press any button to restore the display if it is OFF.

Press any button.

- All LEDs will flutter, then
- Top and bottom row of the display will flash alternately.



Display will flash  when the RS232 Interface has been activated.

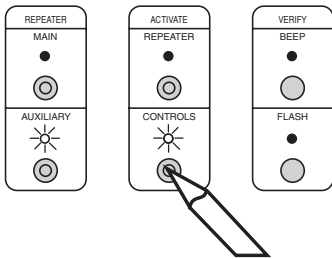


If an RS232 Interface fails to respond as described above, consult the Troubleshooting Section on page 44.

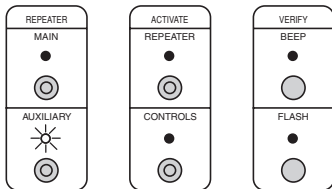
Adding an RS232 Interface

Step 3 Complete RS232 Interface activation

Press and hold the ACTIVATE CONTROLS button on any Repeater until the green ACTIVATE CONTROLS LED turns OFF (approximately 3 seconds).



The green ACTIVATE CONTROLS LED on **ALL** Repeaters will turn OFF. The MAIN or AUXILIARY LED will remain on.

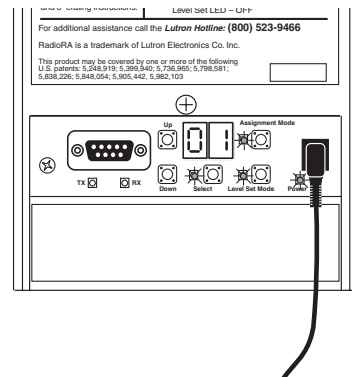


- The RS232 Interface is now activated.



If you want to verify that your RS232 Interface has been activated, enter Flash Mode on any Repeater (see *RadioRA Setup Guide's Troubleshooting Section*).

The RS232 Interface's Display and LEDs will begin to flash.



Exit Flash Mode on the Repeater. The RS232 Interface's Display and LEDs will stop flashing.

- Proceed to the **RS232 Programming Worksheet** on page 10.

Programming Preparations

RS232 Programming Worksheet

After the RS232 Interface has been activated, it can be programmed so that a light or a group of lights can be controlled by one or more Phantom Buttons. Prior to programming your system, complete the RS232 Programming Worksheet (page 11).

Step 1 Record all Dimmer, Switch, and GRAFIK Eye Control Unit locations and control types along the top of the worksheet

(Accessory Dimmers and Accessory Switches do not need to be recorded.)

M.C.Type: RS232 Interface 1 2 3 4 5
 M.C. Location: _____

Phantom Button	Description	Zones				
		Master BR Dimmer	Front Hall Dimmer	Rear hall Switch	Den GRAFIK Eye	Front Porch Switch
1						
2						
3						
4						

Step 3 Record Phantom Button names

Write a description for each Phantom Button under the *Description* column of the worksheet.

M.C.Type: RS232 Interface 1 2 3 4 5
 M.C. Location: A/V Room

Phantom Button	Description	Zones				
		Master BR Dimmer	Front Hall Dimmer	Rear Hall Switch	Den GRAFIK Eye	Front Porch Switch
1	<u>M. Bedroom / Room</u>					
2	<u>Hall / Room</u>					
3	<u>Movie / S</u>					
4						

Step 2 Select an RS232 Interface

Start with any RS232 Interface and write down its location.

M.C.Type: RS232 Interface 1 2 3 4 5
 M.C. Location: A/V Room

Phantom Button	Description	Zones				
		Master BR Dimmer	Front Hall Dimmer	Rear hall Switch	Den GRAFIK Eye	Front Porch Switch
1						
2						
3						
4						

Step 4 Select Dimmers, Switches or GRAFIK Eye Control Units

Select which Dimmers, Switches or GRAFIK Eye Control Units will be controlled by each Phantom Button by going across the worksheet and placing a check in the corresponding box(es).

M.C.Type: RS232 Interface 1 2 3 4 5
 M.C. Location: A/V Room

Phantom Button	Description	Zones				
		Master BR Dimmer	Front Hall Dimmer	Rear Hall Switch	Den GRAFIK Eye	Front Porch Switch
1	<u>M. Bedroom / Room</u>	✓				
2	<u>Hall / Room</u>		✓	✓		
3	<u>Movie / Scene</u>				✓	
4	<u>Goodnight / Scene</u>	✓			✓	✓

- Repeat Steps 1 through 4, for all RS232 Interfaces in your system.
- Proceed to Assigning a Phantom Button as a ROOM or SCENE on page 12.

RS232 PROGRAMMING WORKSHEET

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32

M.C. Type: RS232 Interface

M.C. Location: _____

		Zones																																							
Phantom Button	Description																																								
1																																									
2																																									
3																																									
4																																									
5																																									
6																																									
7																																									
8																																									
9																																									
10																																									
11																																									
12																																									
13																																									
14																																									
15																																									
16	ALL ON																																								
17	ALL OFF																																								

Section 2 - Start-Up

Programming Preparations

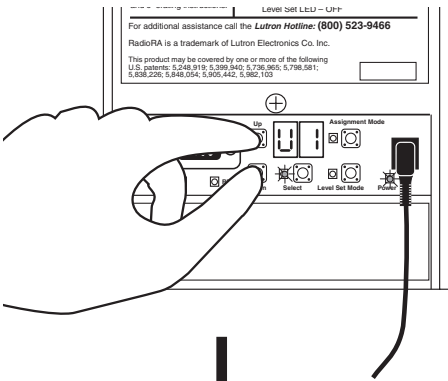
Assigning Phantom Buttons as ROOMS or SCENES

Note: Phantom Buttons 1-15 on an RS232 Interface can be individually programmed as a ROOM or a SCENE.

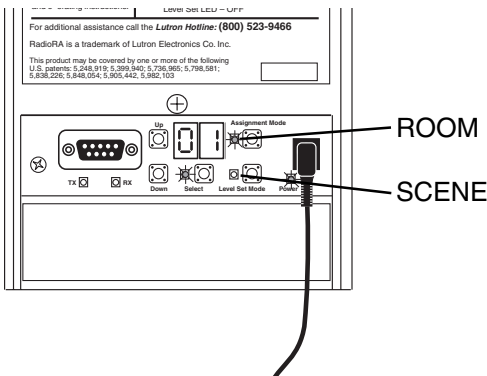
Note: For a description of a ROOM, SCENE or Phantom Button, see the Definitions of Common Terms on page 7.



Step 1 Begin ROOM/SCENE assignment

Simultaneously press and hold the Up and Down buttons until $\cup \downarrow$ (User Programming Mode 1) appears on the display and the Select LED turns ON (approximately 3 seconds).



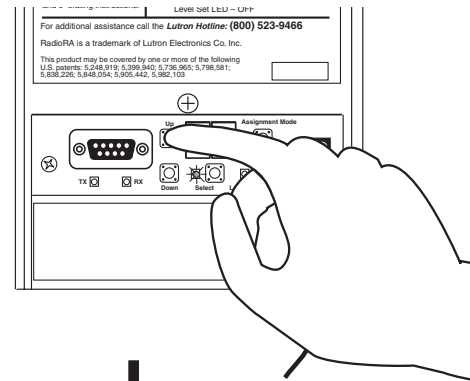
After 3 seconds, the display will begin alternately flashing the Phantom Button Number currently being programmed and $\cup \downarrow$. The Assign or Level Set LED will turn ON indicating whether the current Phantom Button is a ROOM OR SCENE as shown below.



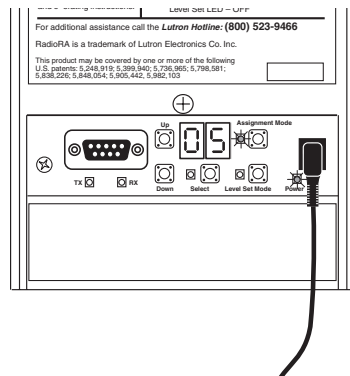
-  By default, all buttons are assigned as ROOMS.
-  Changing a button assignment from ROOM to SCENE (or vice versa) will delete all previous programming of that button.


Step 2 Select Phantom Button to program

Press and hold the Up or Down button until the desired Phantom Button Number is on the display.



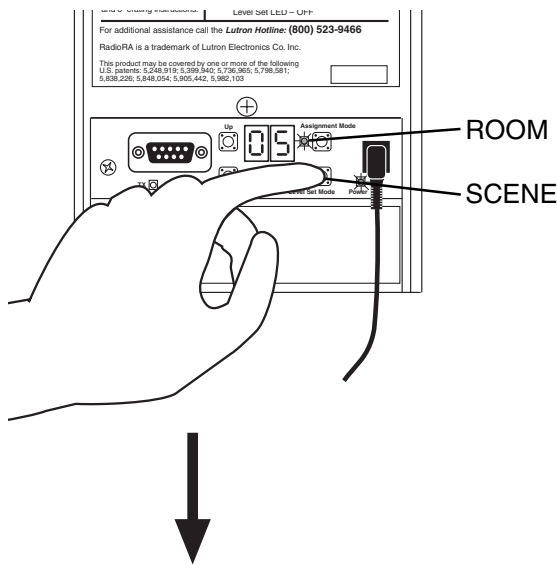
Display will alternately flash the selected Phantom Button Number and $\cup \downarrow$.



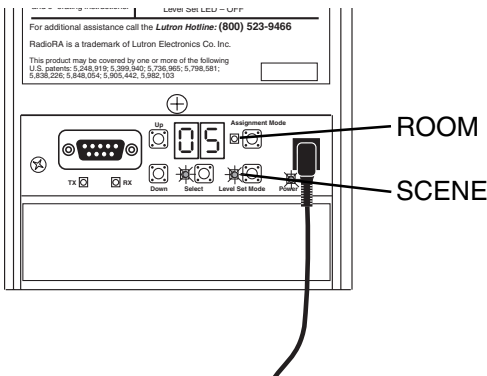
-  ALL ON (Phantom Button 16) and ALL OFF (Phantom Button 17) cannot be accessed in this mode. They are always SCENES.

Step 3 Changing ROOM/SCENE assignment

Press and release the Assign button to make the Phantom Button Number on the display a ROOM; the Assign LED will turn ON. Press and release the Level button to make the Phantom Button Number on the display a SCENE; the Level LED will turn ON.



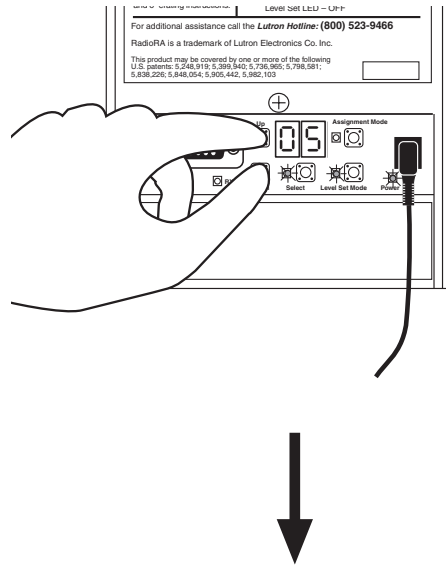
Display will alternately flash the selected Phantom Button Number and U I.



- Repeat Steps 2 and 3 to change ROOM/ SCENE assignment for any remaining buttons.

Step 4 Completing ROOM/SCENE assignment

Simultaneously press and hold the Up and Down buttons until all the LEDs begin to flutter (approximately 3 seconds).



Display will stop flashing. The Select LED and corresponding ROOM/SCENE LEDs will turn OFF.

- Proceed to Assigning Dimmers, Switches or GRAFIK Eye Control units to Phantom ROOM Buttons on page 14.

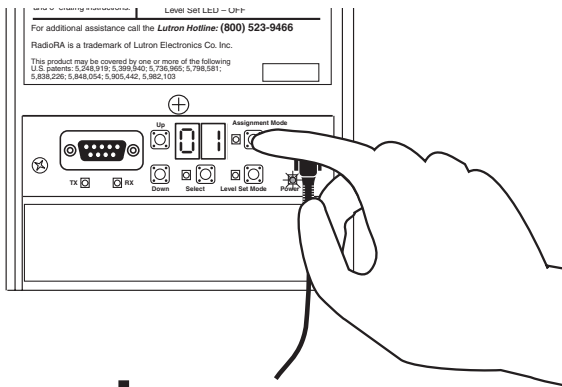
Phantom ROOM Button Programming

Assigning Dimmers, Switches or GRAFIK Eye® Control Units to Phantom ROOM Buttons

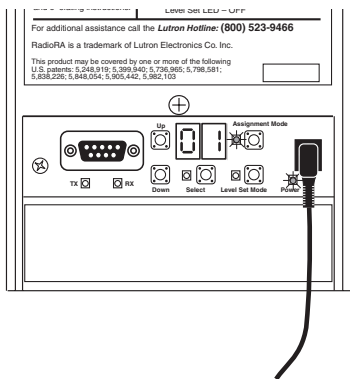
Note: A Phantom Button can also be assigned as a SCENE (see page 12).

Step 1 Begin assigning Dimmers, Switches or GRAFIK Eye Control Units to Phantom ROOM Buttons

Press and hold the Assign button until the Assign LED turns ON and the display begins to flash (approximately 3 seconds).

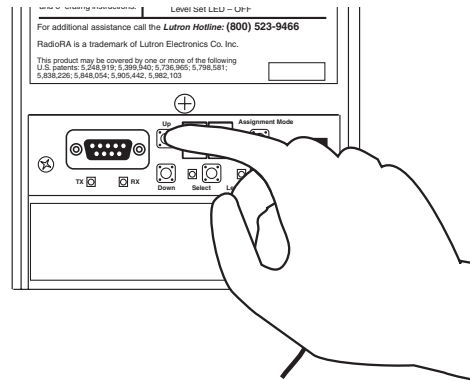


Assign LED will turn ON and the display flashes.

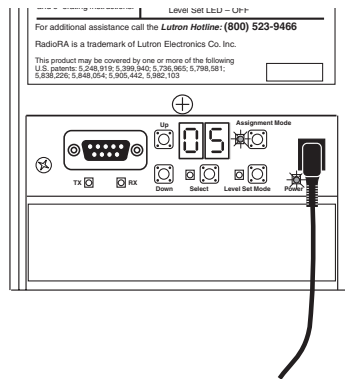


Step 2 Select a Phantom ROOM Button to program

Press and hold the Up or Down button to select the Phantom ROOM Button you want to program.



Selected Phantom ROOM Button Number will flash on the display.



ALL ON (Phantom Button 16) and ALL OFF (Phantom Button 17) cannot be accessed in this mode.

Phantom ROOM Button Programming

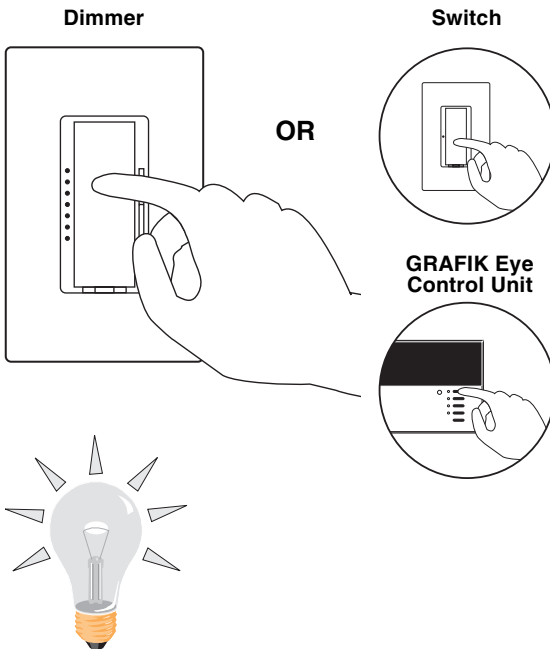
Step 3 Assign a Dimmer, Switch or GRAFIK Eye Control Unit Control to the Phantom Button

Notes:

- Multiple Dimmers, Switches or GRAFIK Eye Control Units can be assigned to a single Phantom ROOM Button.
- Controls must be assigned to a Phantom Button while its number is flashing on the display.

Assign Dimmers or Switches to the Phantom Button by turning the Controls ON.

Assign a GRAFIK Eye Control Unit to the Phantom Button by changing the selected GRAFIK Eye scene.



Note: GRAFIK Eye Control Units will automatically turn on to scene 1 once assigned.

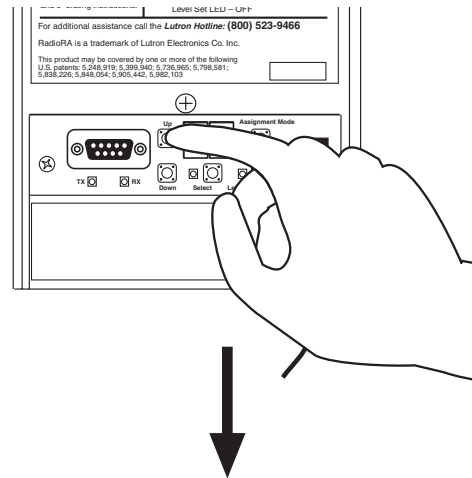


If you assign the wrong Dimmer, Switch or GRAFIK Eye Control Unit to a Phantom Button, turn the Dimmer, Switch or GRAFIK Eye Control Unit OFF to unassign it.

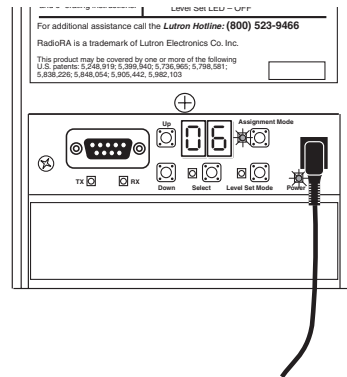


Step 4 Select next Phantom ROOM Button to program

To assign Dimmers, Switches or GRAFIK Eye Control Units to another Phantom ROOM Button, press and hold the Up or Down button to select the next Phantom ROOM Button you want to program.



Assign LED will be ON. Selected Phantom ROOM Button Number will flash on the display.



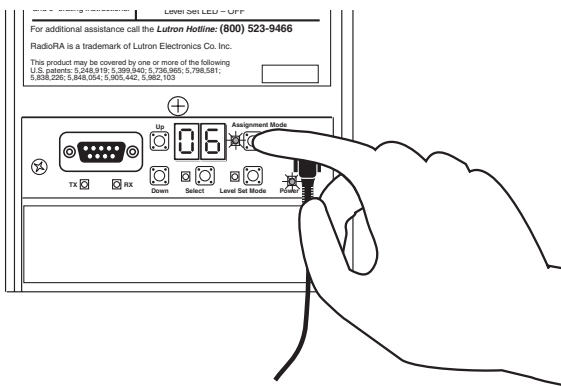
Perform Step 3 for this newly-selected Phantom ROOM Button.

- **Proceed to Step 5 when all Phantom ROOM Buttons on the RS232 Interface have been programmed.**
- **Continued on next page.**

Phantom ROOM Button Programming

Step 5 Complete assigning Dimmers, Switches or GRAFIK Eye Control Units to Phantom ROOM Buttons

Press and hold the Assign button until all the LEDs begin to flutter (approximately 3 seconds).



Display will be ON and the Assign LED will be OFF.

- Proceed to Setting Light Levels/GRAFIK Eye SCENE Selection for Phantom ROOM Buttons on page 17.

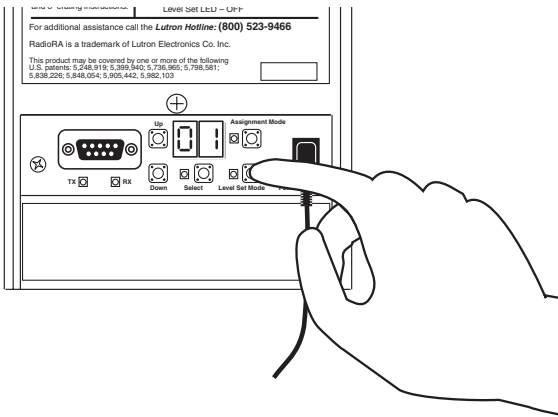
Phantom ROOM Button Programming

Setting Light Levels/GRAFIK Eye® SCENE Selection for Phantom ROOM Buttons

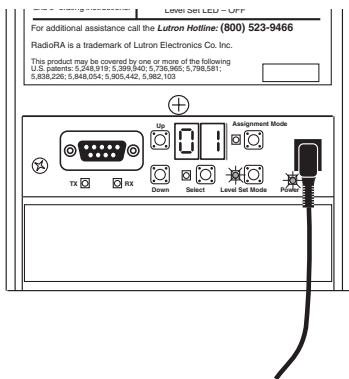
Note: Dimmers can be set to variable light levels. Switches must remain ON. GRAFIK Eye Control Units can be set to any scene.

Step 1 Begin setting light levels/ GRAFIK Eye scene selection

Press and hold the Level Set button until the Level Set LED turns ON and the display begins to flash (approximately 3 seconds).



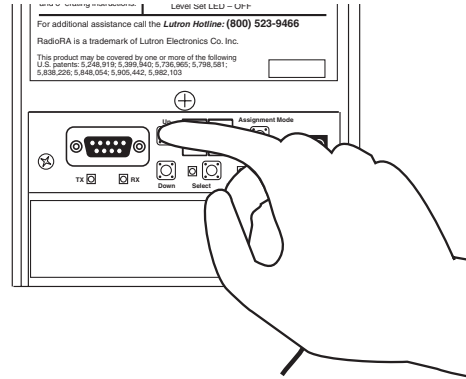
Level Set LED will turn ON and the display will flash.



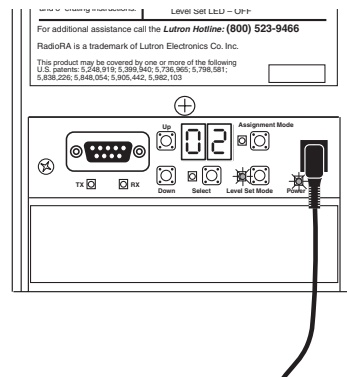
All devices assigned to that Phantom ROOM Button will turn ON to: Dimmers 100% light level, Switches ON, and GRAFIK Eye Control Units to scene 1. All devices not assigned to that Phantom ROOM Button will turn OFF.

Step 2 Select Phantom ROOM Button to program

Press and hold the Up or Down button to select the Phantom ROOM Button you want to program.



Selected Phantom ROOM Button Number will flash on the display.



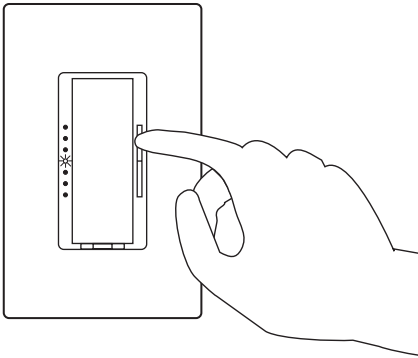
ALL ON (Phantom Button 16) and ALL OFF (Phantom Button 17) cannot be accessed in this mode.

• Continued on next page.

Phantom ROOM Button Programming

Step 3 Set light levels for Dimmers

Use the dimming rocker to adjust the light level of any Dimmer(s) assigned to that button. This is the light level that the Dimmers will turn ON to when the ROOM button is pressed ON.

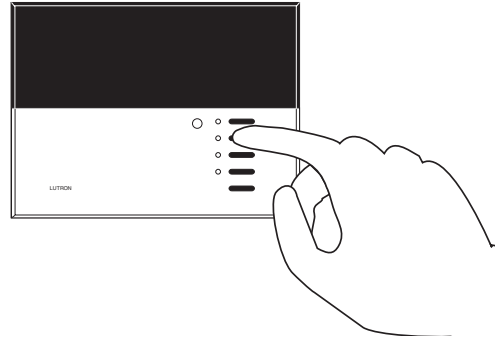


While setting light levels

- Dimmers assigned to a Phantom ROOM Button cannot be turned OFF.
- Dimmers not assigned to a Phantom ROOM Button cannot be turned ON.

Step 4 Select a GRAFIK Eye® scene

At the GRAFIK Eye Control Unit, select one of the pre-programmed scenes (1 through 4) by turning that scene ON.



The GRAFIK Eye Control Unit will turn ON to the scene selected in this step when the Phantom ROOM Button is turned ON. The last scene selected on the GRAFIK Eye Control Unit will be the scene programmed to the Phantom ROOM Button.



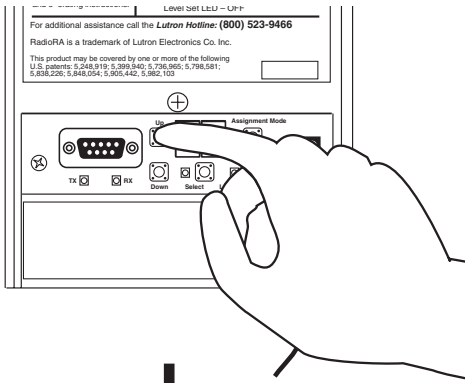
While setting light levels

- GRAFIK Eye Control Units assigned to a Phantom ROOM Button cannot be turned OFF.
- GRAFIK Eye Control Units not assigned to a Phantom ROOM Button cannot be turned ON.

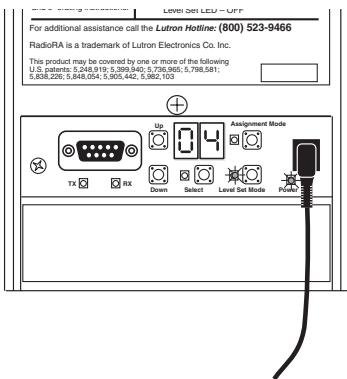
Phantom ROOM Button Programming

Step 5 Select next Phantom ROOM Button to program

To set the light levels for another Phantom ROOM Button, press and hold the Up or Down button to select the Phantom ROOM Button you want to program.



Level Set LED will be ON. Selected Phantom ROOM Button Number will flash on the display.

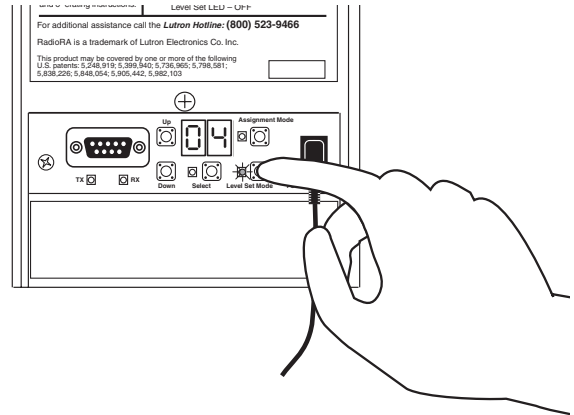


Perform Step 3 for this newly-selected Phantom ROOM Button.

- Proceed to Step 6 when all Phantom ROOM Buttons on the RS232 Interface have been programmed.

Step 6 Complete setting light levels/ GRAFIK Eye scene selection

Press and hold the Level Set button until all the LEDs begin to flutter (approximately 3 seconds).



Level Set LED will turn OFF and the display will stop flashing.

- **Note:** To access scenes 5-16 on a GRAFIK Eye Control Unit, refer to Application Note #48 (P/N 366-730).

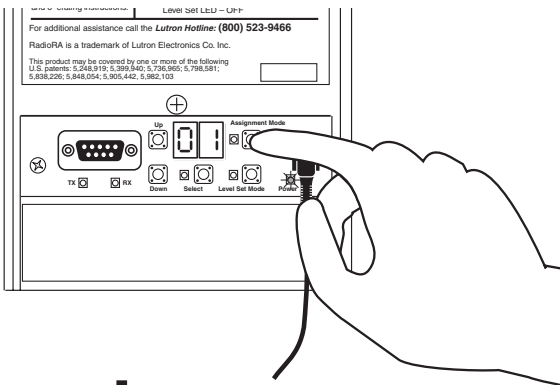
Phantom SCENE Button Programming

Assigning Dimmers, Switches or GRAFIK Eye® Control Units to Phantom SCENE Buttons

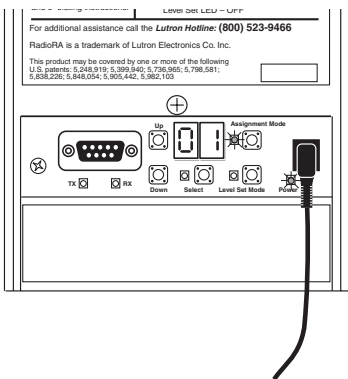
Note: A Phantom Button can also be assigned as a ROOM (see page 12).

Step 1 Begin assigning Dimmers, Switches or GRAFIK Eye Control Units to Phantom SCENE Buttons

Press and hold the Assign button until the Assign LED turns on and the display begins to flash (approximately 3 seconds).

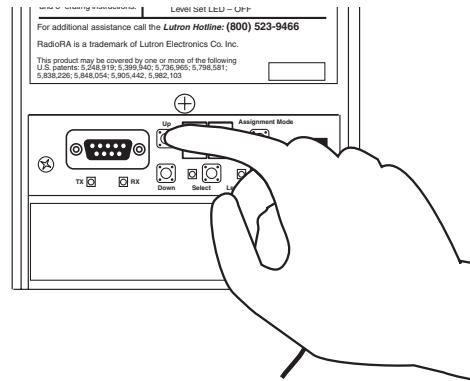


Assign LED will turn ON and the display will flash.

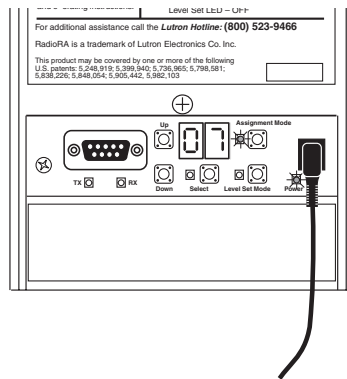


Step 2 Select a Phantom SCENE Button to program

Press and hold the Up or Down button to select the Phantom SCENE Button you want to program.



Selected Phantom SCENE Button Number will flash on the display.



By default, all Dimmers, Switches, or GRAFIK Eye Control Units are assigned to the ALL ON (Phantom Button 16) and ALL OFF (Phantom Button 17) scenes. Turn the Dimmers, Switches, or GRAFIK Eye Control Units OFF to unassign them while programming the ALL ON or ALL OFF scenes.

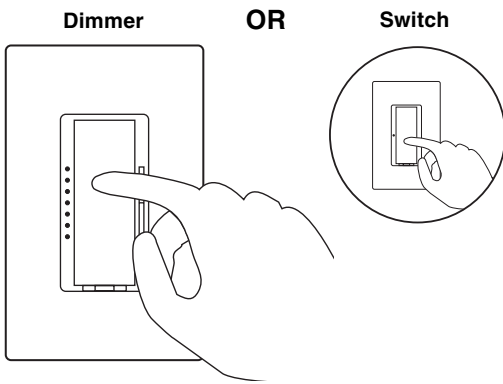
Phantom SCENE Button Programming

Step 3 Assign Dimmers, Switches or GRAFIK Eye Control Units to Phantom SCENE Buttons

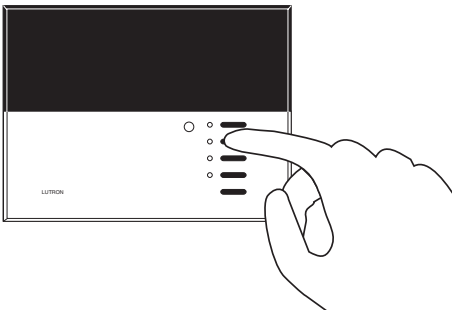


In this Step you must not only assign light controls which you want to turn ON when the scene is selected, you must also assign light controls which you want to turn OFF when the scene is selected.

Assign a Dimmer or Switch to the selected SCENE by turning the Dimmer or Switch ON.



Assign a GRAFIK Eye Control Unit to the selected scene by changing the scene of the GRAFIK Eye Control Unit.



Note: GRAFIK Eye Control Units will automatically turn ON to scene 1 once assigned.

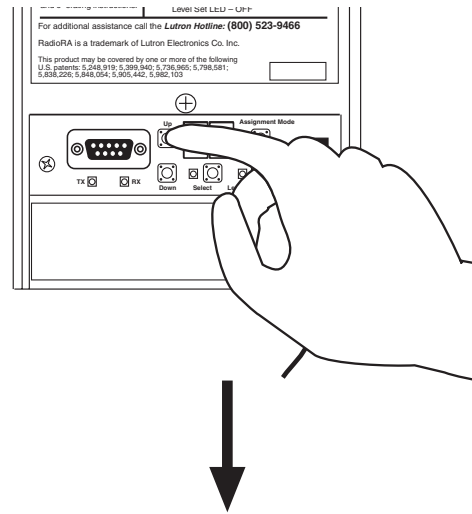


If you assign the wrong Dimmer, Switch or GRAFIK Eye Control Unit to a SCENE, turn the Dimmer, Switch or GRAFIK Eye Control Unit OFF to unassign it.

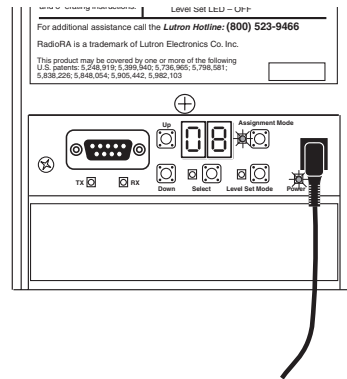


Step 4 Select next Phantom SCENE Button to program

To assign Dimmers, Switches or GRAFIK Eye Control Units to another Phantom SCENE Button, press and hold the Up or Down button to select the next Phantom SCENE Button you want to program.



Assign LED will be ON. Selected Phantom SCENE Button Number will flash on the display.



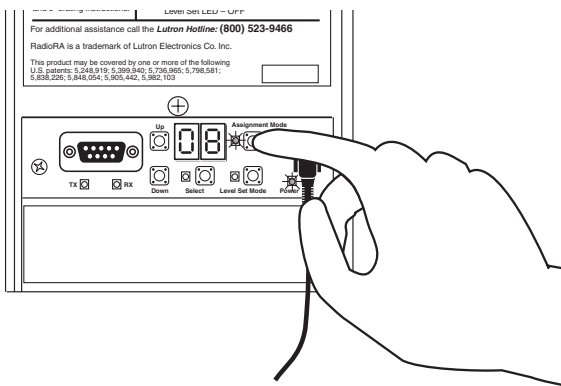
Perform Step 3 for this newly-selected Phantom SCENE Button.

- Proceed to Step 5 when all Phantom SCENE Buttons on the RS232 Interface have been programmed.
- Continued on next page.

Phantom SCENE Button Programming

Step 5 Complete assigning Dimmers, Switches or GRAFIK Eye Control Units to Phantom SCENE Buttons

Press and hold the Assign button until all the LEDs begin to flutter (approximately 3 seconds).



Display will be ON and the Assign LED will be OFF.

- Proceed to Setting Light Levels/GRAFIK Eye SCENE Selection for Phantom SCENE Buttons on page 23.

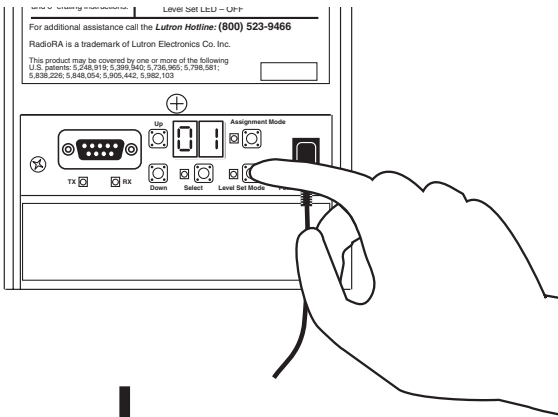
Phantom SCENE Button Programming

Setting Light Levels/GRAFIK Eye® SCENE Selection for Phantom SCENE Buttons

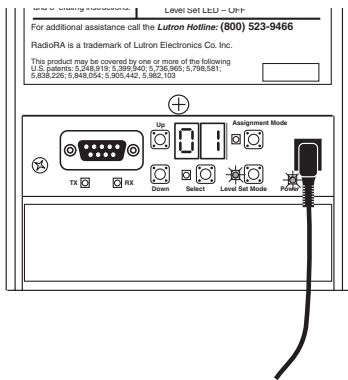
Note: Dimmers can be set to variable light levels or turned OFF. Switches can be turned ON or OFF. GRAFIK Eye Control Units can be set to any scene or turned OFF.

Step 1 Begin setting light levels/ GRAFIK Eye scene selection

Press and hold the Level Set button until the Level Set LED turns ON and the display begins to flash (approximately 3 seconds).



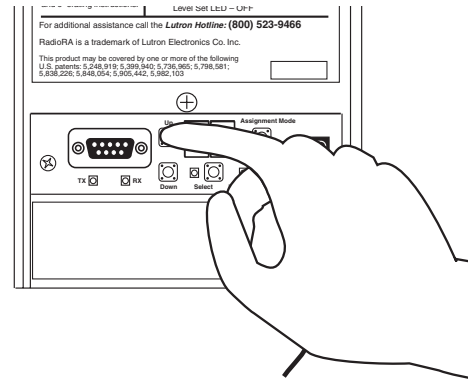
Level Set LED will turn ON and the display will flash.



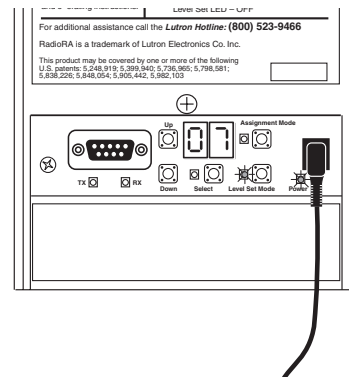
All devices assigned to that Phantom SCENE Button will turn ON to: Dimmers 50% light level, Switches ON, and GRAFIK Eye Control Units to scene 1. All devices not assigned to that Phantom SCENE Button will turn OFF.

Step 2 Select Phantom SCENE Button to program

Press and hold the Up or Down button to select the Phantom SCENE Button you want to program.



Selected Phantom SCENE Button Number will flash on the display.



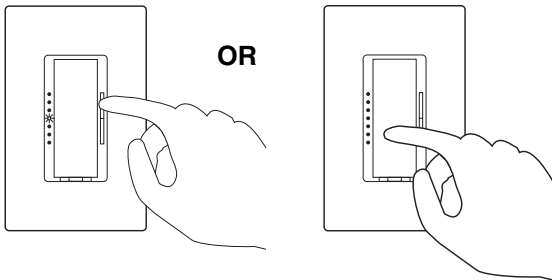
ALL ON (Phantom Button 16) and ALL OFF (Phantom Button 17) cannot be accessed in this mode.

• Continued on next page.

Phantom SCENE Button Programming

Step 3 Set light levels/select GRAFIK Eye scenes

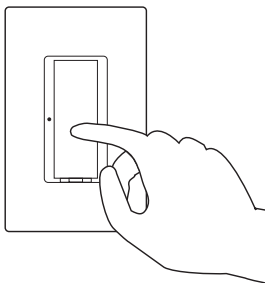
Go to any **assigned** Dimmer (which will be ON at 50%). Adjust this Dimmer's programmed light level for the selected Phantom SCENE Button using the dimming rocker, **or** turn the Dimmer OFF if it is to be turned OFF when this Phantom SCENE Button is selected.



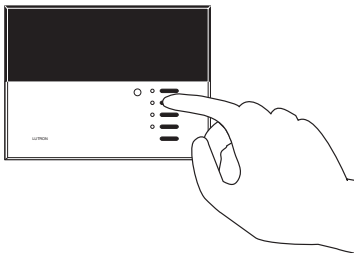
Adjust light levels

Turn OFF

Go to any **assigned** Switch (which will be ON). Turn the Switch OFF if it is to be turned OFF when this Phantom SCENE Button is selected.

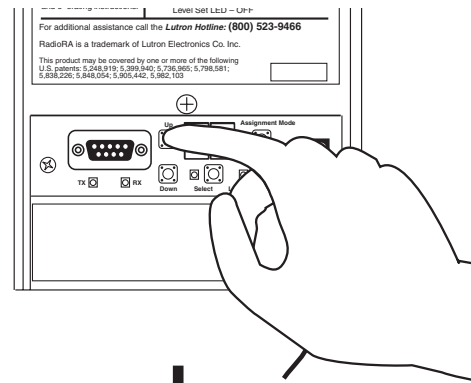


Go to any **assigned** GRAFIK Eye Control Unit (which will be ON at scene 1). Select from pre-programmed scenes (1 through 4) by turning that scene ON **or** select OFF if it is to be turned OFF when this Phantom SCENE Button is selected.

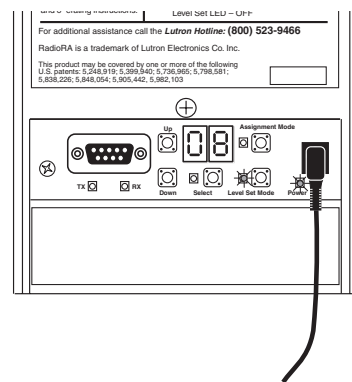


Step 4 Select next Phantom SCENE Button to program

To set the light levels for another Phantom SCENE Button, press and hold the Up or Down button to select the Phantom SCENE Button you want to program.



Level Set LED will be ON. Current Phantom SCENE Button Number will flash on the display.



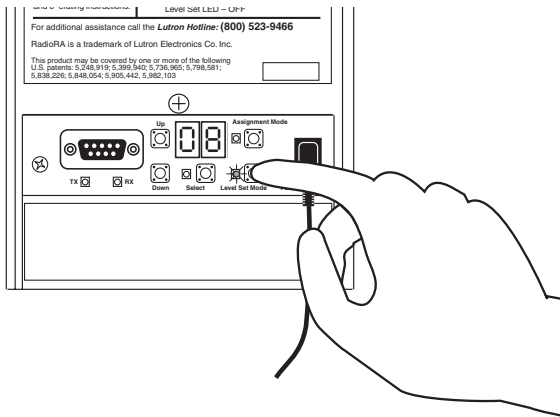
Perform Step 3 for this newly-selected Phantom SCENE Button.

- Proceed to Step 5 when all Phantom SCENE Buttons on the RS232 Interface have been programmed.

Phantom SCENE Button Programming

Step 5 Complete setting light levels/ GRAFIK Eye scene selection

Press and hold the Level Set button until all the LEDs begin to flutter (approximately 3 seconds).



Level Set LED will turn OFF and the display will stop flashing.



If at any point in this procedure you are unsure which Dimmers, Switches or GRAFIK Eye Control Units are assigned to an RS232 Interface Phantom SCENE Button:

- While the display is flashing, press and hold the Select button (approximately 3 seconds).
- The Level Set LED will begin to flash and all Dimmers, Switches, and GRAFIK Eye Control Units assigned to that RS232 Interface Phantom SCENE Button will turn ON to full intensity.

Note: Dimmer, Switch or GRAFIK Eye Control Unit assignments cannot be changed at this time. See page 20 to change control assignment.

- Press the Select button again to continue setting light levels. The Level Set LED will stop flashing.



Note: To access scenes 5-16 on a GRAFIK Eye Control Unit, refer to Application Note #48 (P/N 366-730).

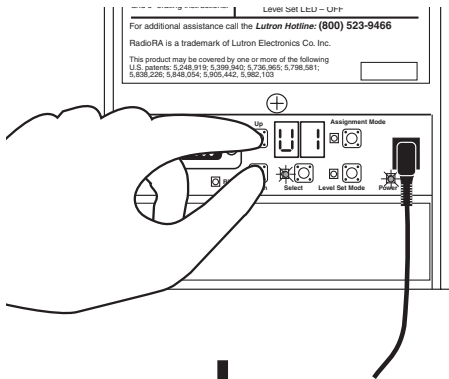
Advanced Programming

Assigning Zone Numbers

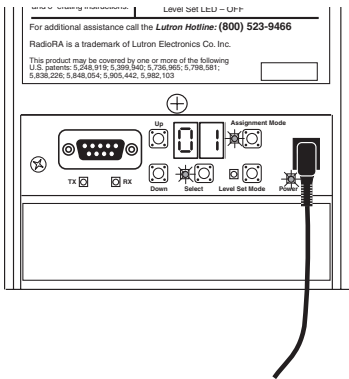
Zone Numbers are only necessary if the RS232 Interface will be used to directly control one zone or if RS232 feedback is desired when a zone changes. The RS232 Programming Worksheet on page 11 is already numbered for your convenience. For a description of a Zone Number, see Definitions of Common Terms on page 7.

Step 1 Begin assigning Zone Numbers

Simultaneously press and hold the Up and Down buttons until the Select LED turns ON and U I appears on the display (approximately 3 seconds).

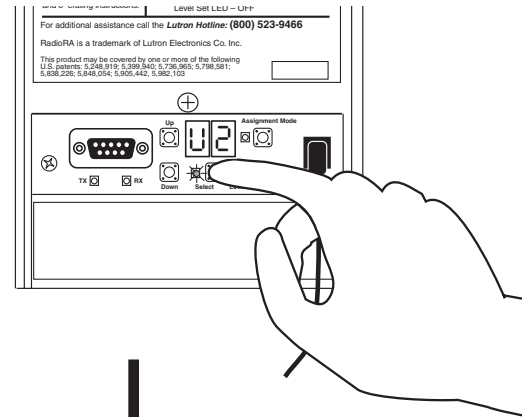


After 3 seconds the display will begin flashing a Phantom Button Number and U I.

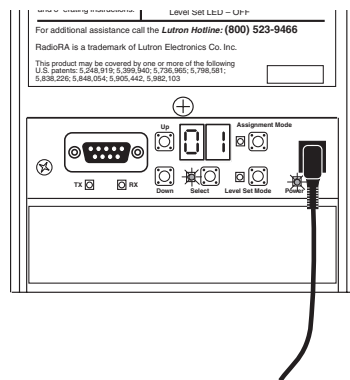


Step 2 Select User Programming Mode 2

Press and release the Select button repeatedly until U 2 appears on the display.

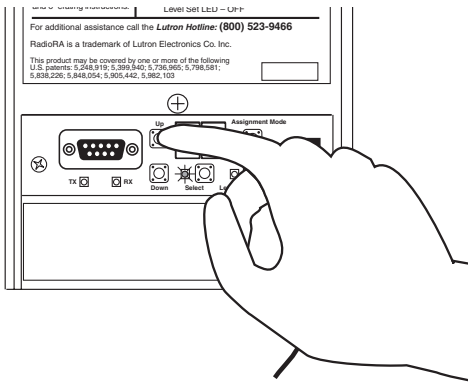


After 3 seconds, the display will begin alternately flashing the Zone Number currently being programmed and U 2. The Select LED will remain ON.

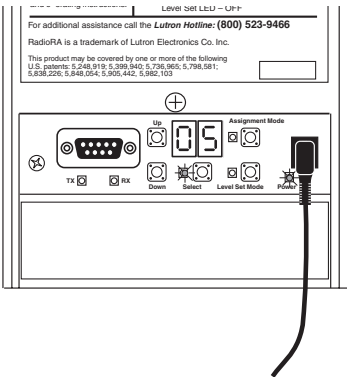


Step 3 Select a Zone Number to program

Press and hold the Up or Down button to select the Zone Number you want to program.

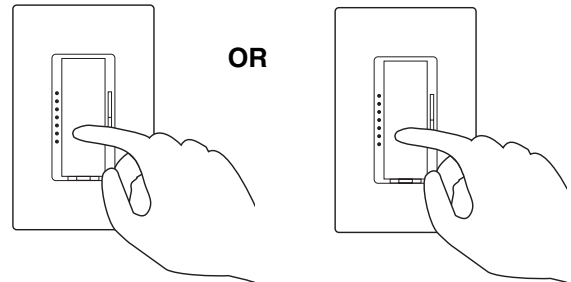


Display will alternately flash the selected Zone Number and U 2.



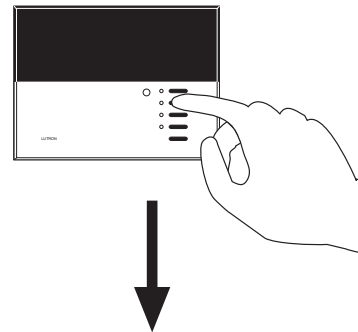
Step 4 Assign a Dimmer, Switch or GRAFIK Eye Control Unit to a Zone Number

Assign a Dimmer or Switch to the displayed Zone Number by turning the Dimmer or Switch ON or OFF.



OR

Assign a GRAFIK Eye Control Unit to the displayed Zone Number by changing scene of the GRAFIK Eye Control Unit.



The Assign LED will flash for approximately 2 seconds. The Level LED will then turn ON indicating that the Zone Number is now programmed.

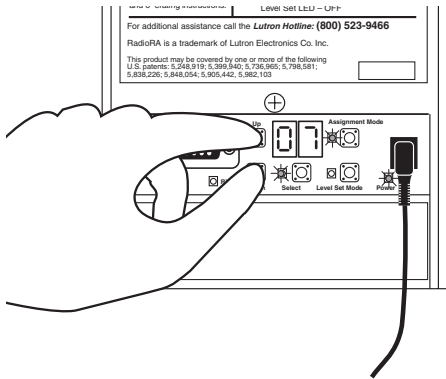


If you assign a Dimmer, Switch or GRAFIK Eye Control Unit to the wrong Zone Number, simply assign the Dimmer, Switch or GRAFIK Eye Control Unit to the correct Zone Number. The programming for the old Zone Number will be erased.

- Repeat Steps 3 and 4 for any remaining Zone Numbers you wish to assign.
- Continued on next page.

Step 5 Complete Zone Number assignment

Simultaneously press and hold the Up and Down buttons until all the LEDs begin to flutter (approximately 3 seconds).



Display will stop flashing and the Select LED will turn OFF.

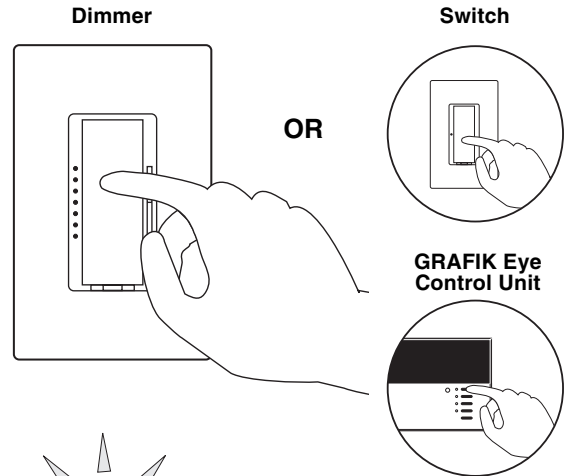


Zone Numbers must be assigned to each RS232 Interface in the system for which zone feedback is desired via RS232.

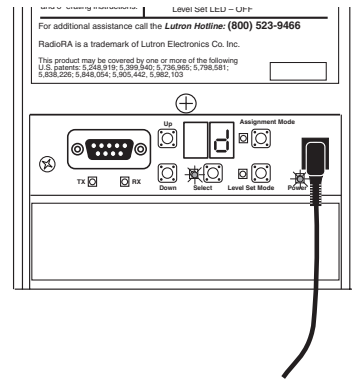
- Repeat Steps 1 through 5 to assign Zone Numbers to any remaining RS232 Interfaces.



To verify a Zone Number assignment, change the status of the Dimmer, Switch or GRAFIK Eye Control Unit by turning it ON or OFF.



The Display will flash \bar{d} followed by the Zone Number assigned. This sequence will flash two times.



Advanced Programming

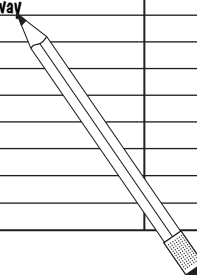
Assigning Master Control Numbers

Master Control Numbers are only necessary if: the RS232 Interface will be used to control the LEDs on a Master Control, RS232 feedback is desired when a Master Control button or a Raise/Lower button is pressed, or RS232 feedback is desired when a Cordless Master Control wakes up or goes to sleep. For a description of a Master Control Number, See Definitions of Common Terms on page 7.

Step 1 Complete the Master Control Number Worksheet

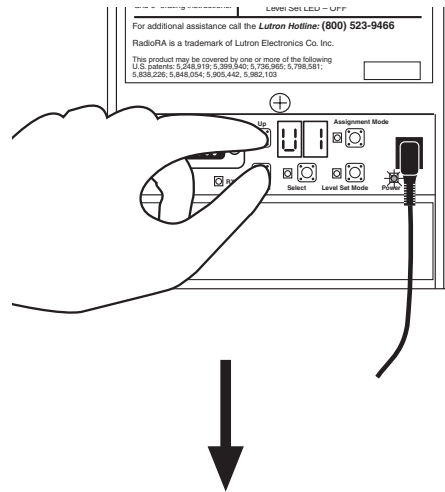
Complete the Master Control Number Worksheet on page 47 for easy reference while assigning the Master Control Numbers.

Master Control Number	Location	Type
1	Master Bedroom	15 button Tabletop
2	Foyer	10 button Cordless
3	Security closet	Switch Closure Interface
4	Main hallway	
5		
6		
7		
8		
9		
10		
11		
12		

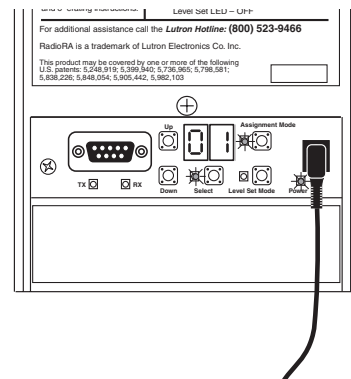


Step 2 Begin assigning Master Control Numbers

Simultaneously press and hold the Up and Down buttons until the Select LED turns ON and U I appears on the display (approximately 3 seconds).



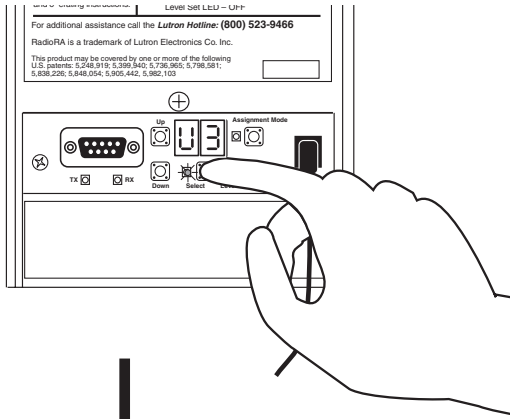
After 3 seconds the display will begin to alternately flash a Phantom Button Number and U I.



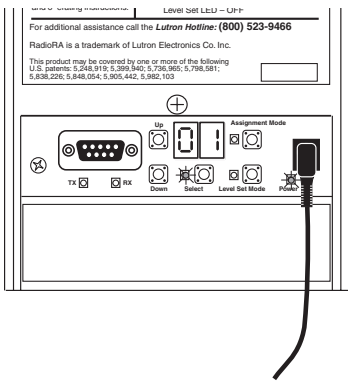
• Continued on next page.

Step 3 Select User Programming Mode 3

Press and release the Select button repeatedly until 03 appears on the display.

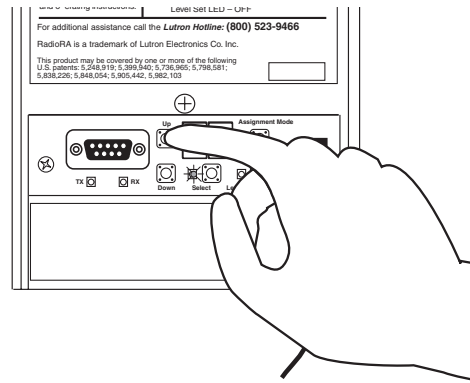


After 3 seconds, the display will begin alternately flashing the Master Control Number currently being programmed and 03. The Select LED will remain ON.

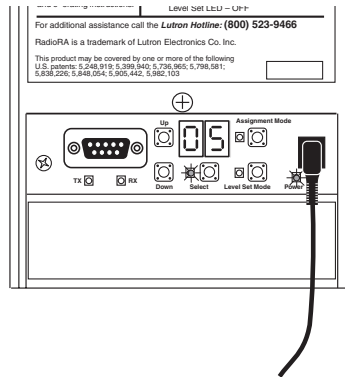


Step 4 Select a Master Control Number to program

Press and hold the Up or Down button to select the Master Control Number you want to program.

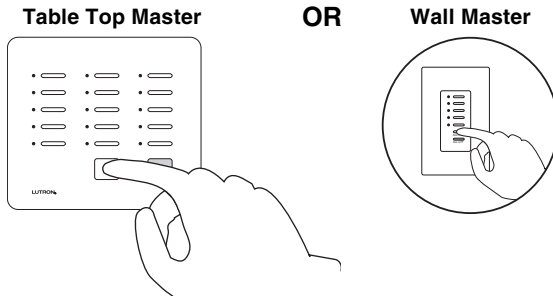


Display will alternately flash the Master Control Number and 03.

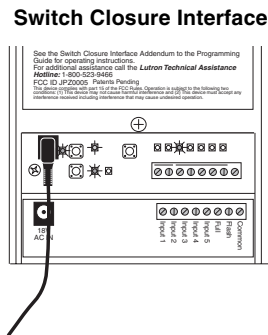


Step 5 Assign a Master Control to a Master Control Number

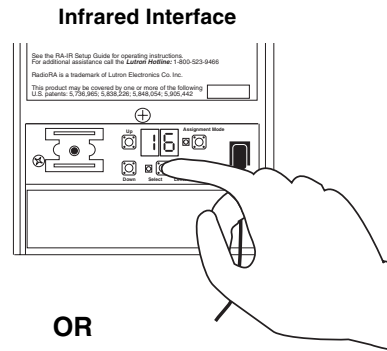
Assign a Master Control to the displayed Master Control Number by pressing the ALL ON button on the Master Control.



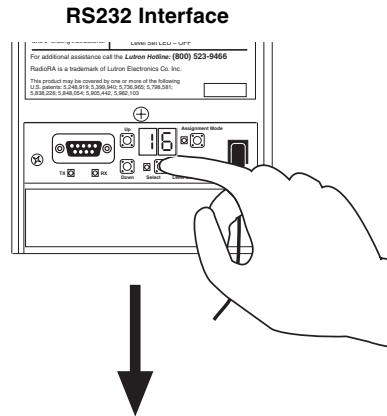
Assign a Switch Closure Interface to the displayed Master Control Number by activating any previously **programmed** input channel (1 – 5) on the Switch Closure Interface. (An input channel can be activated by an external device or by jumpering a wire between the input channel and common terminals.)



Assign an Infrared Interface or RS232 Interface to the displayed Master Control Number by pressing the Up or Down button until the ALL ON (SCENE 16) is on the display. After the ALL ON (SCENE 16) is on the display, press and release the Select button.



OR



The Assign LED on the RS232 Interface being programmed will flash for approximately 2 seconds. The Level LED will then turn ON indicating that the Master Control Number is now programmed.

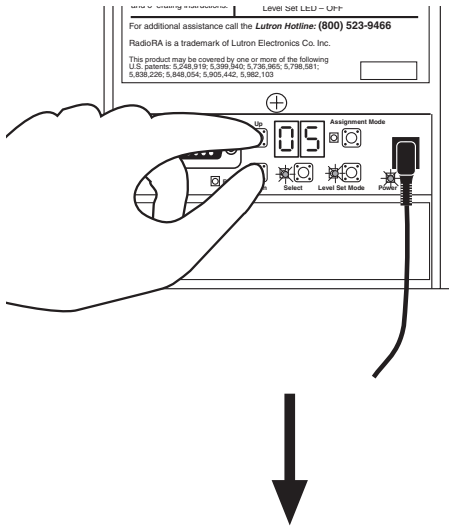


If you assign the wrong Master Control to a Master Control Number, simply assign the Master Control to the correct Master Control Number. The programming for the old Master Control Number will be erased.

- Repeat Steps 4 and 5 for any remaining Master Control Numbers you wish to assign.
- Continued on next page.

Step 6 Complete Master Control Number assignment

Simultaneously press and hold the Up and Down buttons until all the LEDs begin to flutter (approximately 3 seconds).



Display will stop flashing and the Select LED will turn OFF.



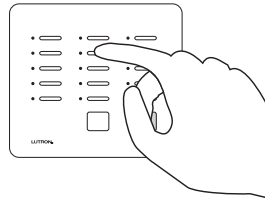
Master Control Numbers must be assigned to each RS232 Interface in the system.

- Repeat Steps 1 through 6 to assign Master Control Numbers to any remaining RS232 Interfaces.



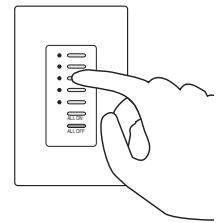
To verify a Master Control Number, select any programmed Room, Scene, or Input Channel on the Master Control.

Table Top Master

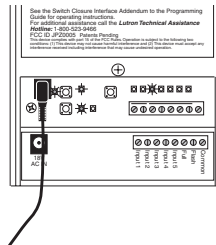


OR

Wall Master

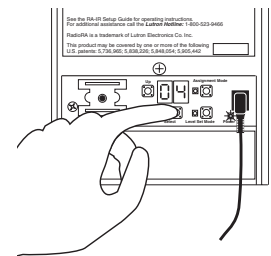


Switch Closure Interface



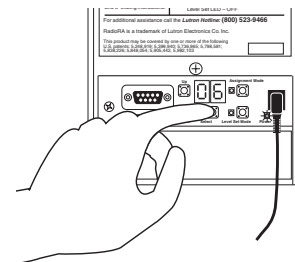
OR

Infrared Interface



OR

RS232 Interface



The Display will flash [n] (Master Control Number) followed by the programmed Master Control Number. The display will then flash [b] (Master Control button) followed by the button or input channel number. This sequence will flash two times.

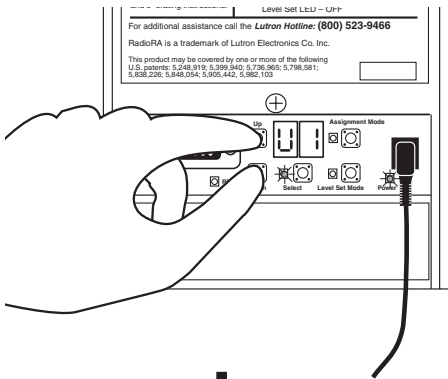
Advanced Programming

Turning Hardware Handshaking ON or OFF

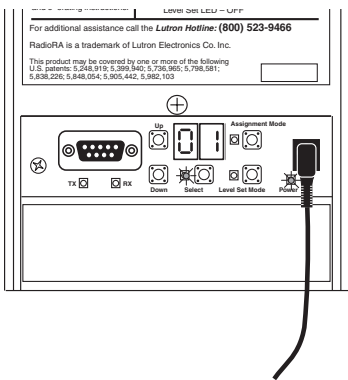
Hardware handshaking can be used to ensure that no data is lost during high speed RS232 communication. To find out more about hardware handshaking, refer to the RadioRA® RS232 Protocol and Programming Guide (P/N 044-006).

Step 1 Begin hardware handshaking assignment

Simultaneously press and hold the Up and Down buttons until the Select LED turns ON and **U I** appears on the display (approximately 3 seconds).

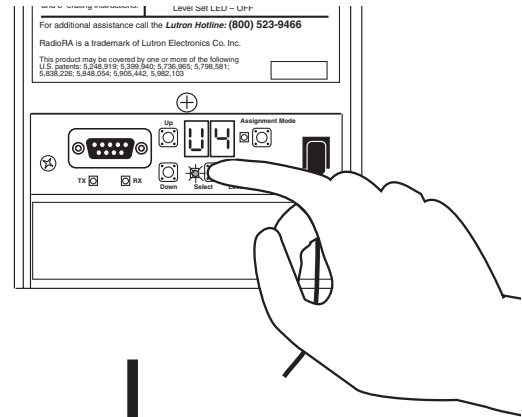


After 3 seconds the display will begin flashing a Phantom Button Number and **U I**.

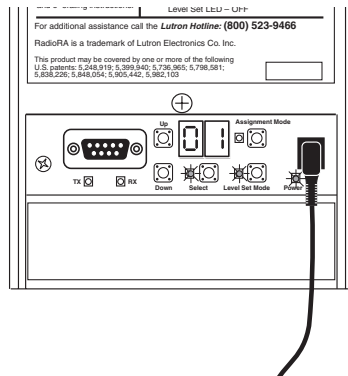


Step 2 Select User Programming Mode 4

Press and release the Select button repeatedly until **U 4** appears on the display.



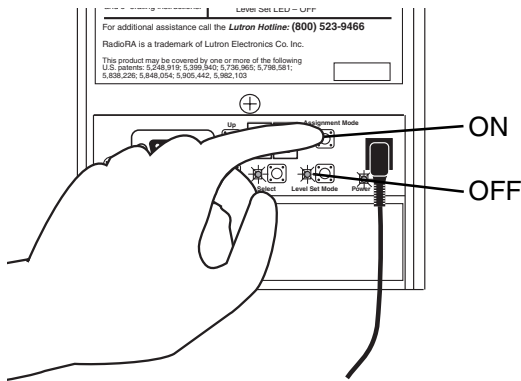
After 3 seconds, the display will begin alternately flashing **U I** and **U 4**. The Select LED will remain ON.



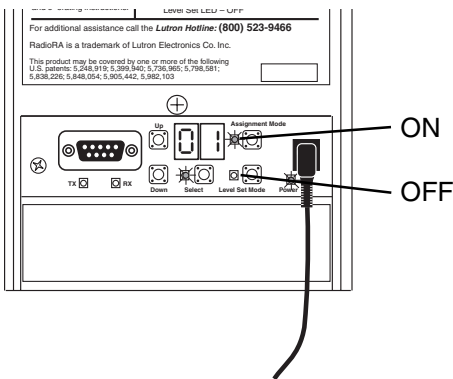
• Continued on next page.

Step 3 Changing hardware handshaking settings

Press and release the Assign button to turn hardware handshaking ON; the Assign LED will turn ON. Press and release the Level button to turn hardware handshaking OFF, the Level LED will turn ON.

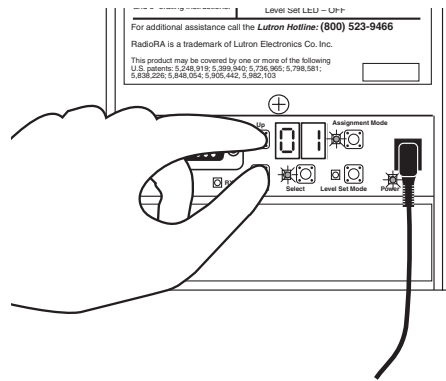


Display will alternately flash 0 1 and 0 4.



Step 4 Completing hardware handshaking assignment

Simultaneously press and hold the Up and Down buttons until all the LEDs begin to flutter (approximately 3 seconds).



Display will stop flashing and the Select LED will turn OFF.

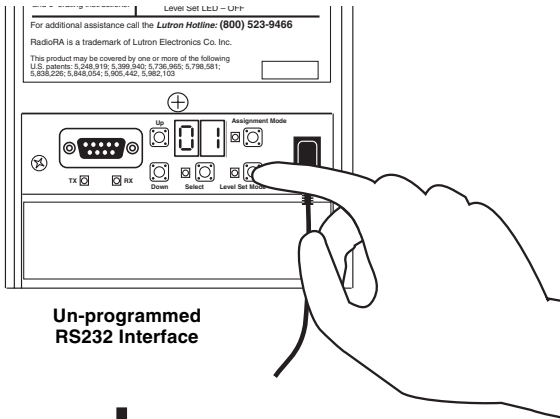
Advanced Programming

Copying Button Programming from a Master Control or an RS232 Interface to an RS232 Interface

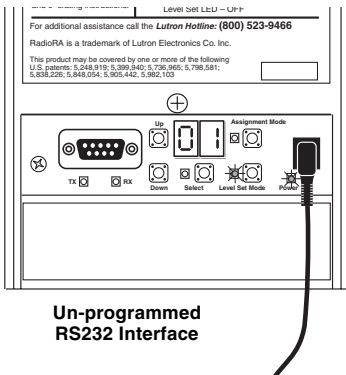
If you have more than one RS232 Interface or Master Control in your system, you can copy the Phantom Button programming from a previously programmed RS232 Interface or Master Control to an un-programmed RS232 Interface Phantom Button so that both buttons function identically.

Step 1 Begin copying button programming

On the RS232 Interface you want to program, press and hold the Level Set button until the Level Set LED turns ON and the display begins to flash (approximately 3 seconds).



Un-programmed RS232 Interface



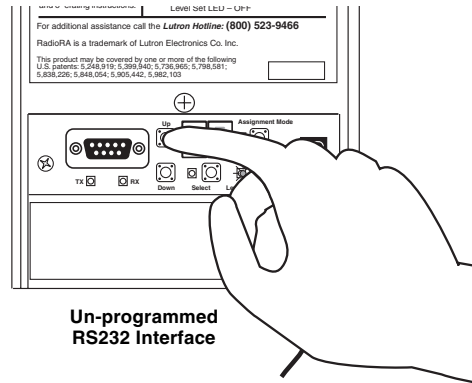
Un-programmed RS232 Interface

Level Set LED will turn ON and the display will flash.

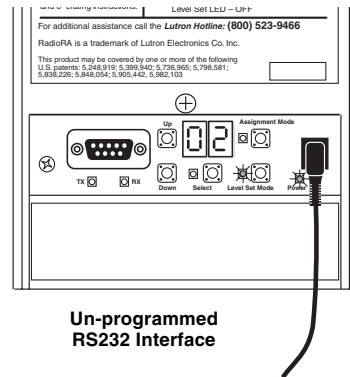
Note: LEDs on all other Master Controls and RS232 Interfaces will flash.

Step 2 Select the Phantom Button you want to program

Press and hold the Up or Down button to select the Phantom Button you want to program.



Un-programmed RS232 Interface



Un-programmed RS232 Interface

Phantom Button Number to be programmed will flash on the display and Level Set LED will be ON.

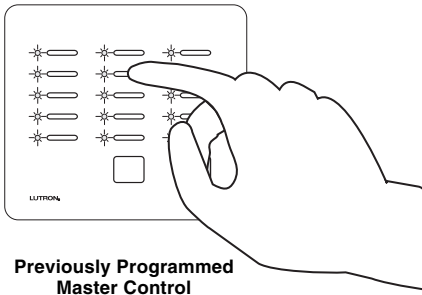


The programming from a ROOM button cannot be copied to a SCENE, or vice versa.

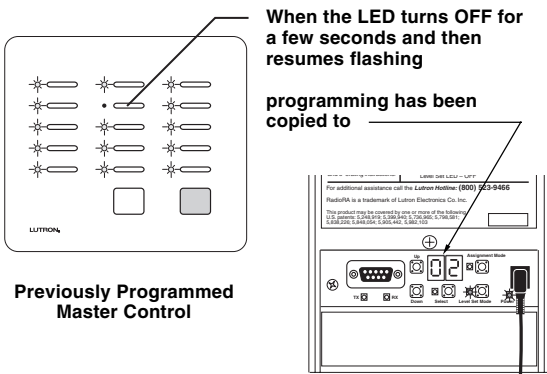
• Continued on next page.

Step 3 Select the button you want to copy from a Master Control

On a previously programmed Master Control, press and hold the programmed button that you want to copy until its LED turns OFF (approximately 3 seconds).



Previously Programmed Master Control

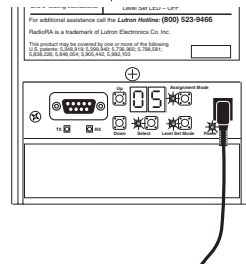
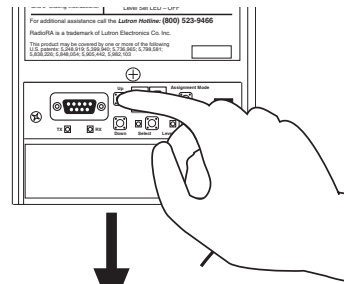


Previously Programmed Master Control

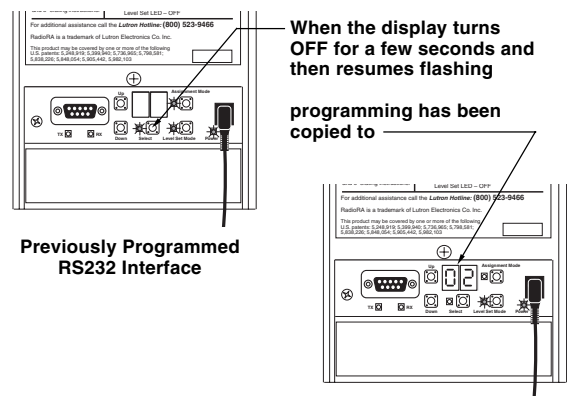
Newly Programmed RS232 Interface

OR Select the Phantom Button you want to copy from an RS232 Interface

On a previously programmed RS232 Interface, press and hold the Up or Down button to select the Phantom Button Number you want to program.



Press and hold the Select button until the display turns OFF (approximately 3 seconds).



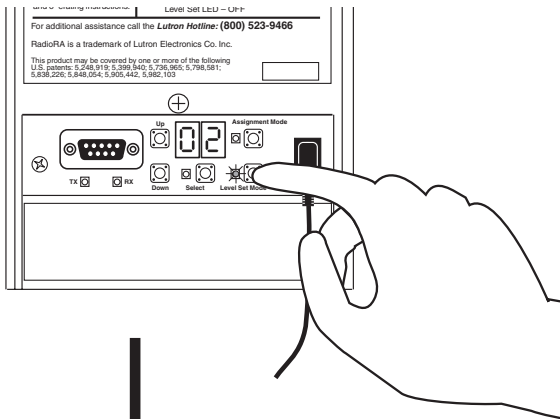
Previously Programmed RS232 Interface

Newly Programmed RS232 Interface

- Repeat Steps 2 and 3 for all RS232 Interface Phantom Buttons for which you want to copy programming.

Step 4 Complete copy button programming

Press and hold the Level Set button until all LEDs flutter (approximately 3 seconds).



Level Set LED will turn OFF and the display will stop flashing.

- Repeat Steps 1 through 4 to copy button programming on any remaining unprogrammed RS232 Interfaces.

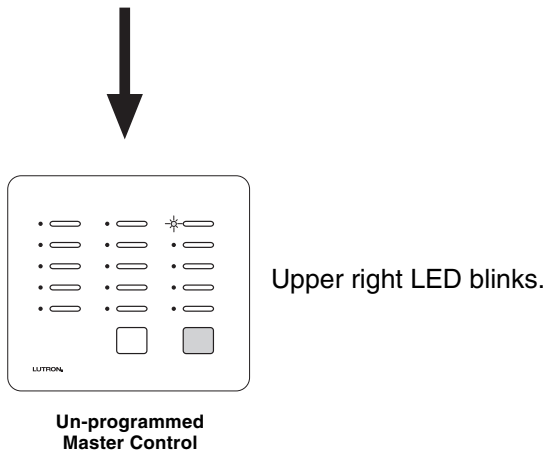
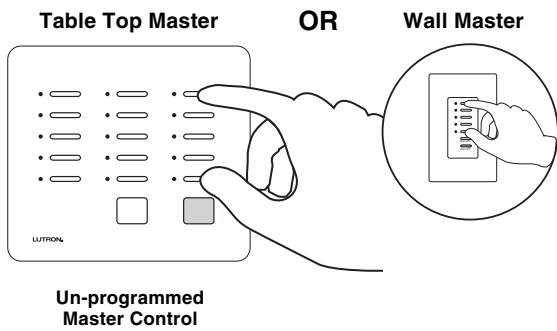
Advanced Programming

Copying Button Programming from an RS232 Interface to a Master Control

If you have a Master Control in your system, you can copy the Phantom Button programming from a previously programmed RS232 Interface to an un-programmed Master Control button so that both buttons function identically.

Step 1 Begin copying button programming

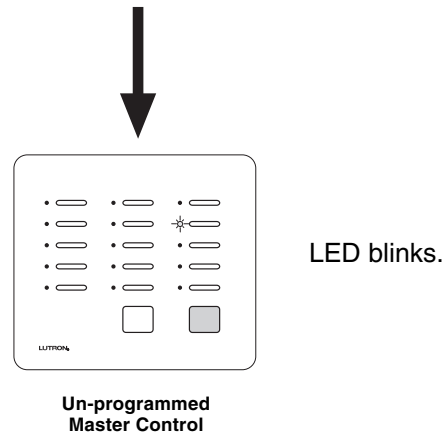
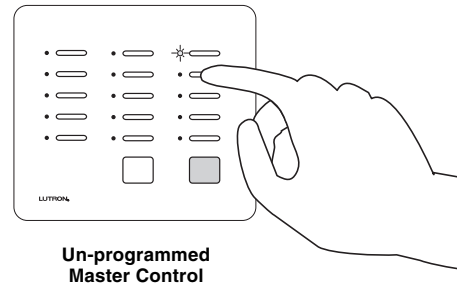
On the Master Control you want to program, simultaneously press and hold the 1st and 5th buttons in the right most column until the upper right LED begins to blink (approximately 3 seconds).




Note: LEDs on all other Master Controls and RS232 Interfaces will flash.

Step 2 Select the button you want to program

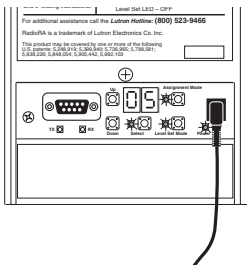
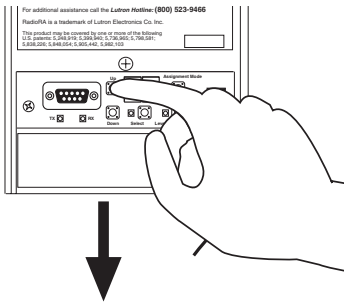
Press and release the button you want to program. Its LED will begin to blink.



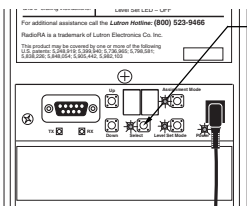
 The programming from a SCENE button cannot be copied to a ROOM button, or vice versa.

Step 3 Select the Phantom Button you want to copy from the RS232 Interface

On a previously programmed RS232 Interface, press and hold the Up or Down button until the Phantom Button Number you want to copy is on the display.



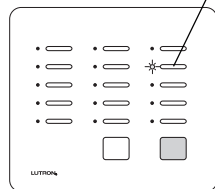
Press and hold the Select button until the display turns OFF (approximately 3 seconds).



Previously Programmed RS232 Interface

When the display turns OFF for a few seconds and then resumes flashing

programming has been copied to

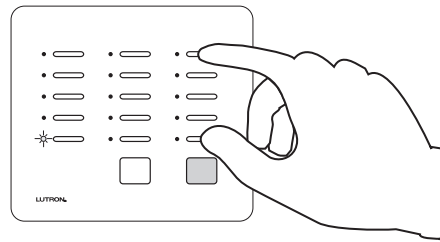


Newly Programmed Master Control

- Repeat Steps 2 and 3 for all Master Control buttons for which you want to copy programming.

Step 4 Complete copy button programming

Simultaneously press and hold the 1st and 5th buttons in the right most column until all LEDs begin to flutter (approximately 3 seconds).



Newly Programmed Master Control

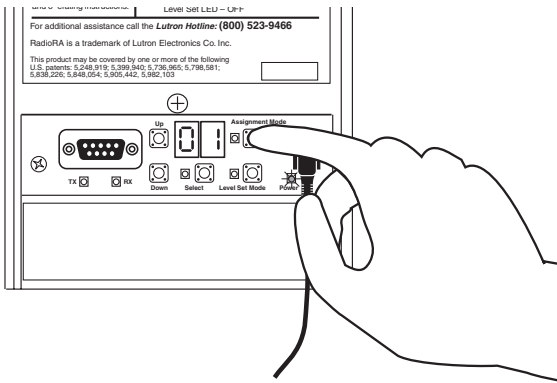
- Repeat Steps 1 through 4 to copy button programming on any remaining unprogrammed Master Controls.

Erasing Phantom Button Programming

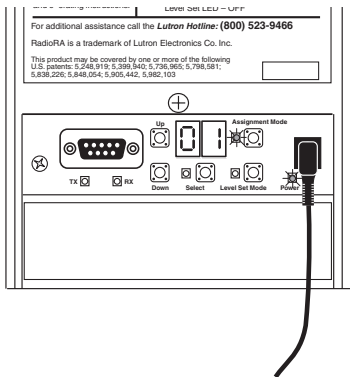
Erasing Phantom Button Programming will remove all Dimming or Switching Controls assigned to an RS232 Interface Phantom Button.

Step 1 Begin erasing Phantom Button programming

Press and hold the Assign button until the Assign LED turns on and the display begins to flash (approximately 3 seconds).

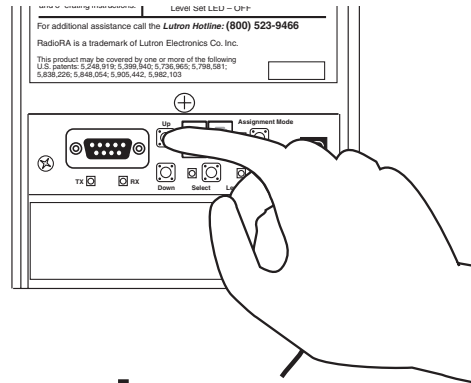


Assign LED will turn ON and the display will flash.

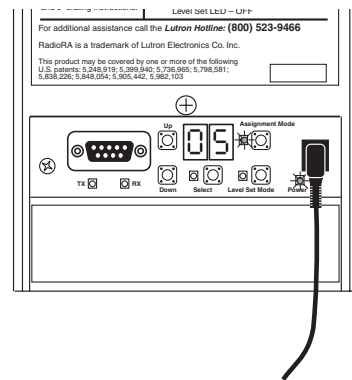


Step 2 Select a Phantom Button to erase

Press and hold the Up or Down button to select the Phantom Button Number you want to erase.

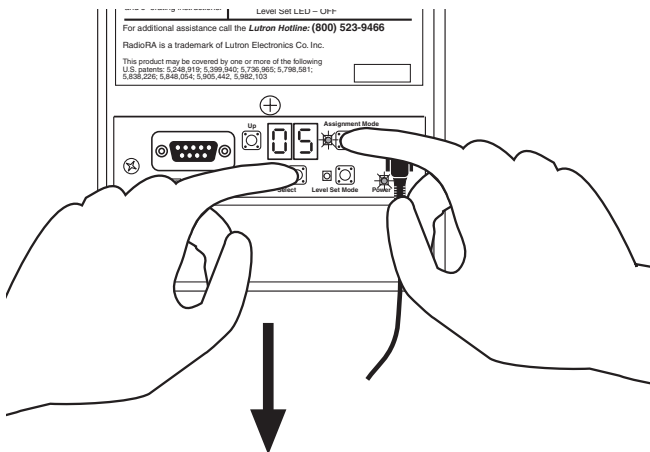


Selected Phantom Button Number will flash on the display.

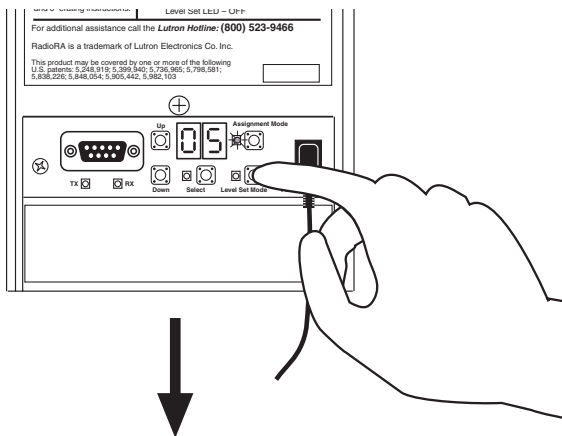


Step 3 Erase Phantom Button programming

Simultaneously press and hold the Select and Assign buttons until the Assign LED begins to flutter and the display stops flashing (approximately 3 seconds).



While the Assign LED is fluttering, press the Level Set button. **Note:** The Assign LED will only flutter for 3 seconds.



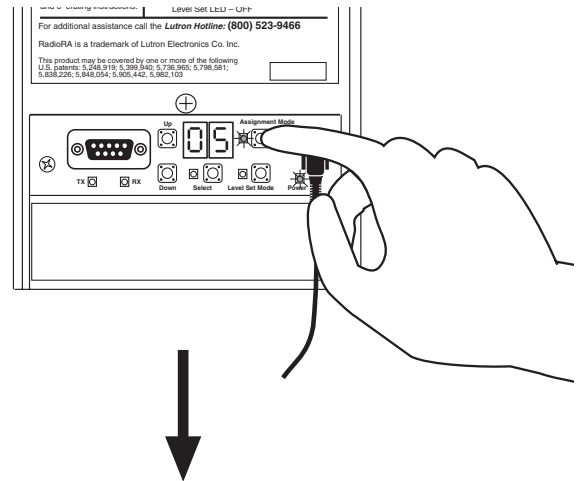
The Assign LED will stop fluttering and will turn ON. The display will begin to flash. All Dimmers and/or Switches will turn OFF. Programming is now erased from that RS232 Interface Phantom Button.



- Repeat Steps 2 and 3 for all RS232 Interface Phantom Buttons with programming that you want to erase.

Step 4 Complete erasing Phantom Button programming

Press and hold the Assign button until the display stops flashing and the Assign LED turns OFF (approximately 3 seconds).

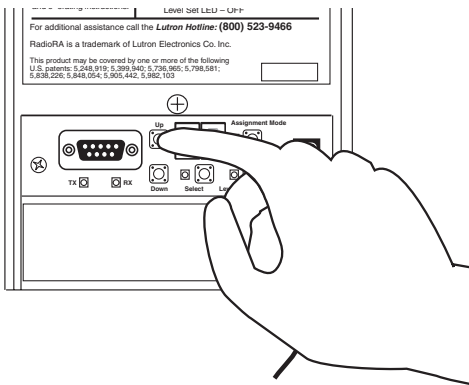


Display will be ON and the Assign LED will be OFF.

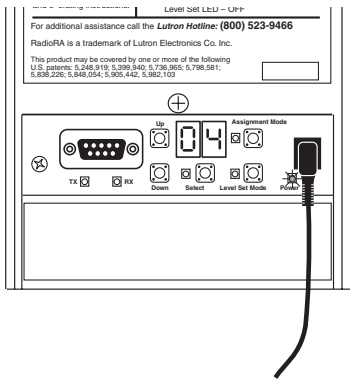
Toggling a Phantom Button ON or OFF Locally

Step 1 Select a Phantom Button to toggle ON or OFF

Press and hold the Up or Down button to select the Phantom Button you want to Toggle ON or OFF.

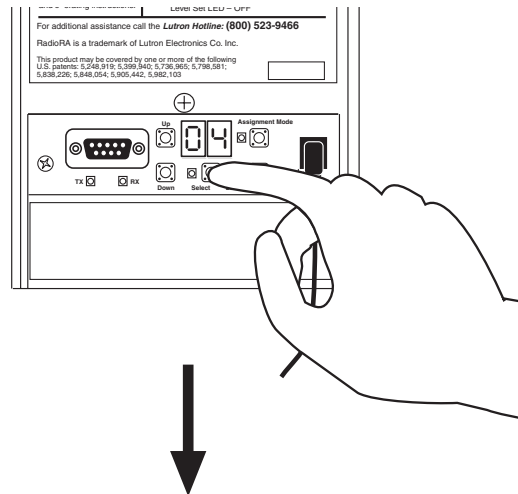


Selected Phantom Button Number will be on the display.



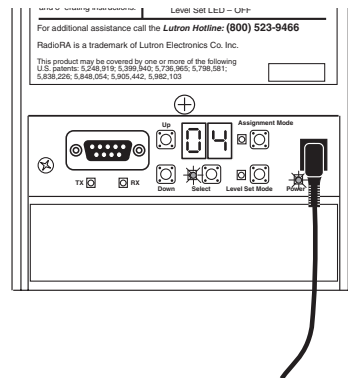
Step 2 Toggle Phantom Button

Press and release the Select button.



The Select LED will flutter.

Note: If no Dimmers, Switches, or GRAFIK Eye Control Units are assigned to the selected Phantom Button, the Select LED **will not** flutter.









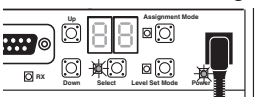
Displayed Phantom Button is ON when the Select LED is ON.


- **ALL ON (Phantom Button 16)** will only turn ON Dimmers, Switches, and GRAFIK Eye Control Units when pressed.
- **ALL OFF (Phantom Button 17)** will only turn OFF Dimmers, Switches, and GRAFIK Eye Control Units when pressed.

Operation

Feedback During Normal Operation

During normal operation, if Zone Numbers and/or Master Control Numbers are assigned to system devices, alpha and numeric feedback will flash on the display of the RS232 Interface when an action occurs. The following chart is used to identify feedback.

Display	Cause
"r c" 	A valid RS232 command was received.
Alternately flashing "c n" followed by a Control Number, and "c b" followed by a Button Number. 	A numbered Master Control button was pressed and feedback was transmitted via the RS232 Interface. Example: Display shows "c n", "02", "c b", "16" means that button 16 (ALL ON) was pressed on Master Control 02.
Alternately flashing "z" followed by a Zone Number. 	The status of a numbered zone was changed locally and feedback was transmitted via the RS232 Interface. Example: Display shows "z", "24" means that the status of zone 24 was changed locally.
Flashing "S o" 	The RS232 Interface caused the RadioRA® System to go into Security Solid Mode.
Flashing "F L" 	The RS232 Interface caused the RadioRA® System to go into Security Flash Mode.
Alternately flashing "S o", "F L" 	The RS232 Interface caused the RadioRA® System to go into Security Solid and Security Flash Mode.
Select LED fluttering 	The RS232 Interface is transmitting an RF command.

 For questions regarding the feedback via RS232, see the RadioRA® RS232 Protocol and Programming Guide (P/N 044-006).

Troubleshooting Guide

Proper operation of the RadioRA Wireless Central Home Lighting Control System is based upon a complex series of radio frequency (RF) communications between system components. As such, it is highly dependent upon proper system installation and programming of controls.


If you experience difficulties programming or operating your RadioRA system, please refer to this guide. Many symptoms of common system activation or programming errors are contained in this Troubleshooting Guide. If you are having a problem with your system not described here, or if you have any questions, call the **Lutron Technical Support Center** at 1-800-523-9466.

	Symptom	Possible Cause	Remedy
I	ACTIVATE CONTROLS LED on MAIN or AUXILIARY Repeater turns ON and then back OFF when attempting to go into ACTIVATE CONTROLS mode.	Your system has encountered a neighboring system within RF communication range also in ACTIVATE CONTROLS mode.	Discontinue activating your RadioRA system until activation of the neighboring system is complete.
II	After activating an RS232 Interface, the RS232 Interface LEDs flutter for approximately 5 seconds then go out, and "--" is still on the display.	RS232 Interface is out of RF communication range of nearest system Repeater.	Move a system Repeater closer to the RS232 Interface in question, or vice versa, or you may have to add another Repeater.
		System not in ACTIVATE CONTROLS mode.	Place system in ACTIVATE CONTROLS mode.
III	The RS232 Interface appears to not be working at all and the Power LED is OFF.	No power available to the RS232 Interface.	Check that breaker is on and not tripped.
		Faulty power supply.	Verify that the plug in power supply is working.
IV	The RS232 Interface appears to not be working at all and the Power LED is ON.	The RS232 Interface was not programmed properly.	Reprogram the RS232 Interface.
		The RS232 Interface may be out of RF communication range of the nearest Repeater.	Verify whether the RS232 Interface is in range of a Repeater by placing the system in BEEP mode.
		RS232 Interface is in powersave mode.	Press and release any button on the RS232 Interface.
V	RX LED not flashing when sending an RS232 command to the RS232 Interface.	RS232 cable not connected to both devices.	Check cable connections.
		Incorrect type of RS232 cable.	Verify cable, see the RadioRA RS232 Protocol and Programming Guide (P/N 044-006).
VI	No RS232 feedback and TX LED is flashing.	RS232 cable not connected to both devices.	Check cable connections.
		Incorrect type of RS232 cable.	Verify cable, see the RadioRA RS232 Protocol and Programming Guide (P/N 044-006).
		External device using incorrect baud rate.	Verify baud rate of external device is set to 9600 baud.
VII	No RS232 feedback and TX LED is not flashing.	RS232 Interface not programmed.	Program the RS232 Interface.
		Handshaking set incorrectly.	Verify handshaking, see Turning Hardware Handshaking ON or OFF, page 33.


	Symptom	Possible Cause	Remedy
VIII	“r c” does not appear on the display and no action occurs when an RS232 command is sent from an external device.	RS232 Interface not programmed.	Program the RS232 Interface.
		RS232 command is incorrect.	Verify command and parameters are accurate.
		External device using incorrect baud rate.	Verify baud rate of external device is set to 9600 baud.
IX	No feedback appears on the RS232 Interface display when a Master Control button is pressed.	Master Control does not have a Master Control Number.	Verify Master Control Number, see Assigning Master Control Numbers, page 29.
		Master Control button press feedback is not turned ON.	Verify Master Control button press feedback is turned ON, see the RadioRA RS232 Protocol and Programming Guide (P/N 044-006).
X	No feedback appears on the RS232 Interface display when a Dimmer, Switch, or GRAFIK Eye Control Unit's level is changed locally.	Dimmer, Switch, or GRAFIK Eye Control unit does not have a Zone Number.	Verify Zone Number, see Assigning Zone Numbers, page 26.
		Local Zone Change feedback is not turned ON.	Verify Local Zone Change feedback is turned ON, see the RadioRA RS232 Protocol and Programming Guide (P/N 044-006).

Returning to Default Factory Settings

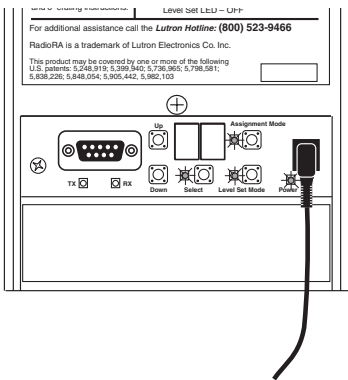
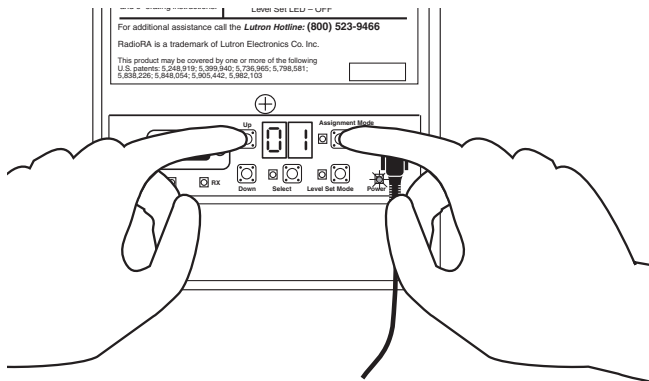
RS232 Interface

 Returning an RS232 Interface to Default Factory Settings will permanently delete all current programming information. **Do not do this unless you are sure that it is necessary.** For more information call the **Lutron Technical Support Center at 1-800-523-9466.**

Step 1 Begin returning to Default Factory Settings

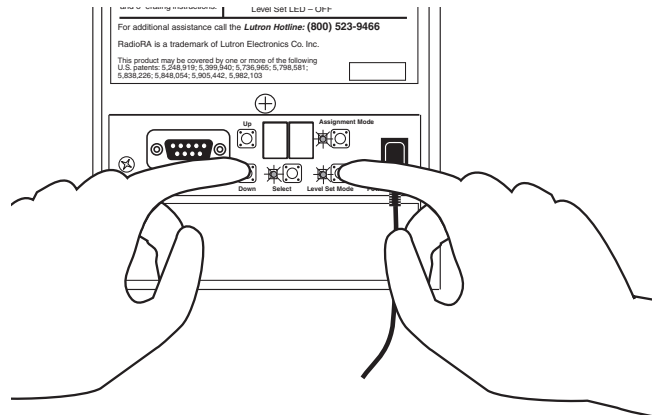
 Ensure that the **ACTIVATE REPEATER LED** or **ACTIVATE CONTROLS LED** on any Repeater is **NOT ON** before proceeding. If either LED is ON, press the corresponding button until its LED turns OFF (approximately 3 seconds).

Press and hold the **Up** and **Assign** buttons until the display turns OFF and the LEDs begin to flutter (approximately 3 seconds).

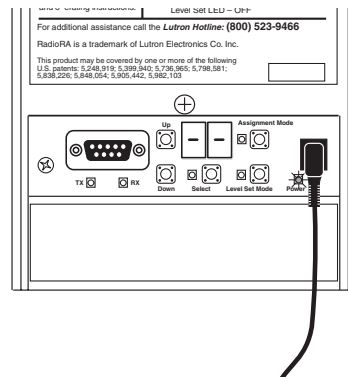


Step 2 Complete returning to Default Factory Settings

While the LEDs are fluttering, press and hold the **Down** and **Level Set** buttons until the RS232 Interface resets (“- -” will be on the display).



All LEDs (except the Power LED) will turn OFF and the display will show “- -” indicating that the RS232 Interface has been returned to Default Factory Settings.



MASTER CONTROL NUMBER WORKSHEET



Master Control Number	Location	Type
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		

Master Control Number	Location	Type
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		

LIMITED WARRANTY

Lutron will, at its option, repair or replace any unit that is defective in materials or manufacture within one year after purchase. For warranty service, return unit to place of purchase or mail to Lutron at 7200 Suter Rd., Coopersburg, PA 18036-1299, postage pre-paid.

THIS WARRANTY IS IN LIEU OF ALL OTHER EXPRESS WARRANTIES, AND THE IMPLIED WARRANTY OF MERCHANTABILITY IS LIMITED TO ONE YEAR FROM PURCHASE. THIS WARRANTY DOES NOT COVER THE COST OF INSTALLATION, REMOVAL OR REINSTALLATION, OR DAMAGE RESULTING FROM MISUSE, ABUSE, OR DAMAGE FROM IMPROPER WIRING OR INSTALLATION. THIS WARRANTY DOES NOT COVER INCIDENTAL OR CONSEQUENTIAL DAMAGES. LUTRON'S LIABILITY ON ANY CLAIM FOR DAMAGES ARISING OUT OF OR IN CONNECTION WITH THE MANUFACTURE, SALE, INSTALLATION, DELIVERY, OR USE OF THE UNIT SHALL NEVER EXCEED THE PURCHASE PRICE OF THE UNIT. This warranty gives you specific legal rights, and you may have other rights which vary from state to state. Some states do not allow the exclusion or limitation of incidental or consequential damages, or limitation on how long an implied warranty may last, so the above limitations may not apply to you.

This product may be covered under one or more of the following U.S. patents: 4,835,343; 4,954,768; 5,248,919; 5,399,940; 5,637,930; 5,736,965; 5,798,581; 5,838,226; 5,848,054; 5,905,442; 5,982,103; DES 353,798; DES 378,814; DES 389,461; DES 389,805; DES 395,037; DES 404,013; DES 422,969; DES 428,855; DES 436,579 and corresponding foreign patents. U.S. and foreign patents pending. Lutron, GRAFIK Eye, and RadioRA are registered trademarks of Lutron Electronics Co., Inc.

© 2001 Lutron Electronics Co., Inc.

Technical and Sales Assistance

If you have questions concerning the installation or operation of this product, call the toll-free **Lutron Technical Support Center**. Please provide exact model number when calling.
(800) 523-9466 (U.S.A., Canada, and the Caribbean)
Other countries call (610) 282-3800
Fax: (610) 282-3090
Visit our web site at www.lutron.com

World Headquarters

Lutron Electronics Co., Inc.
7200 Suter Road
Coopersburg, PA 18036-1299 U.S.A.

TOLL FREE: (800) 523-9466 (U.S.A., Canada, and the Caribbean)

Tel: (610) 282-3800
Fax: (610) 282-3090

Lutron Electronics Co., Inc., reserves the right to make improvements or changes in its products without prior notice. Although every attempt is made to ensure that this information is accurate and up to date, please check with Lutron to confirm product availability, latest specifications and suitability for your application.