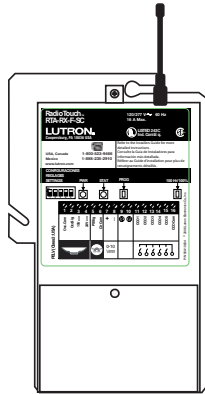


Please Read



RadioTouch™ RS232 Interface

Setup and Installation Guide



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This manual is an addendum to the *RadioTouch* Installer's Guide. The procedures to set up a *RadioTouch* RS232 interface are contained in this manual. The *RadioTouch* RS232 interface is simply another transmitter in the *RadioTouch* System. The RS232 interface has the ability to communicate with up to 10 unique zones of lights, Sivoia® QED shades, or contact closure outputs in a single room. This device can not report the status of the lighting zones, Sivoia QED shades, or contact closure outputs back to the host RS232 device.



Danger! This *RadioTouch* system must not be used to control equipment, other than lighting, which is not visible from every transmitter 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 *RadioTouch* system include (but are not limited to) motorized gates, garage doors, industrial doors, 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 transmitter location and that only suitable equipment is connected to this *RadioTouch* 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., Inc. could void the user's authority to operate this equipment.

System Overview

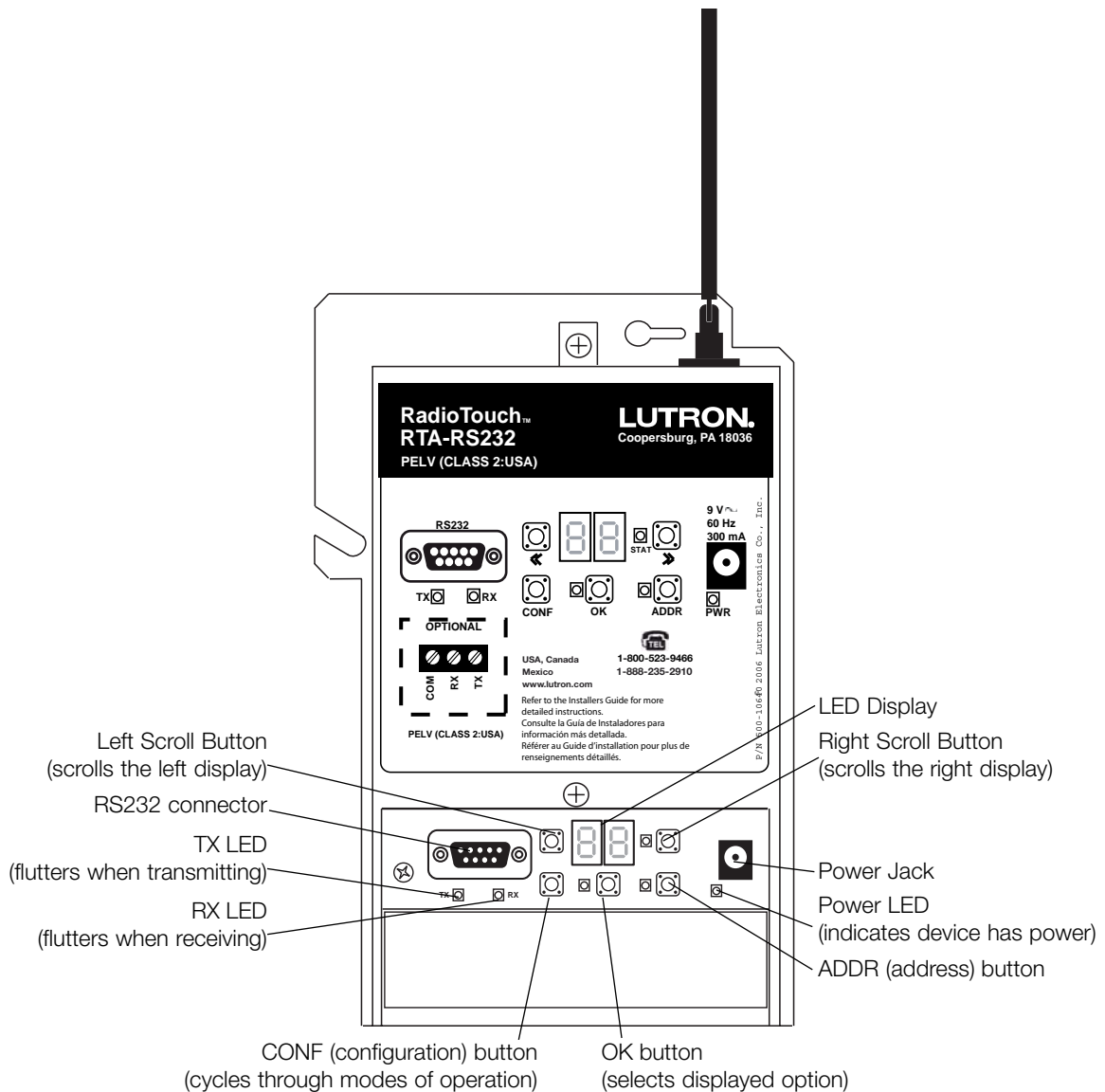
This manual contains information on how to set up and install an RS232 interface. It also contains information regarding the RS232 command set and how to interface the RTA-RS232 with equipment external to the *RadioTouch* system.

The RTA-RS232 allows an external device, such as a touch screen, to control *RadioTouch* lighting and window shading loads.

The *RadioTouch* RS232 interface is capable of controlling 10 unique lighting or contact closure output zones in the *RadioTouch* system.

Note: The 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.




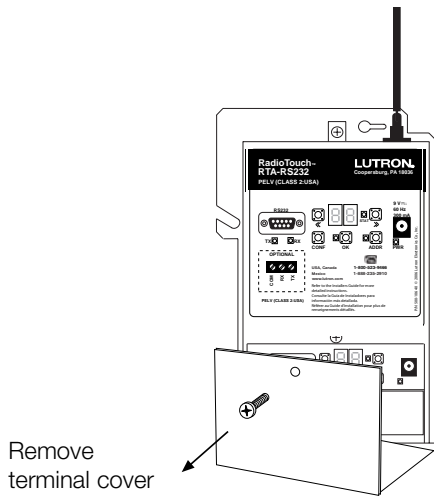
Dimensions and Mounting

Attach the Power Supply

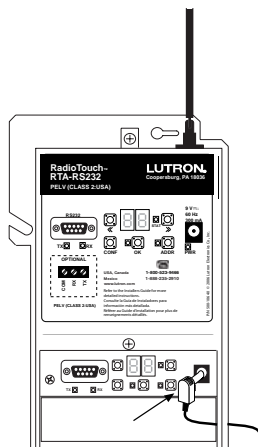
Remove terminal cover. Route the power supply cord through the knockouts located on either side of the unit. Place the provided grommet in the knockout hole before wiring. Attach the power supply cord to the RS232 (jack located in the bottom right corner).

 **Caution!** Observe all local and national electrical codes and safety standards.

 **Danger!** Do not connect line voltage to the RTA-RS232. Connecting line voltage can result in personal injury or damage to the control or other equipment.



Remove terminal cover



Route wires through punched holes

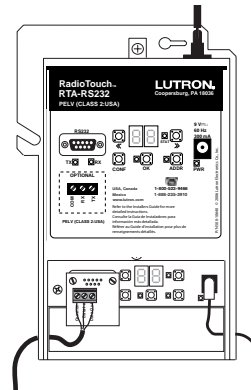
Connect the RS232 Cable

For 3 wire software flow control or no flow control, connect the three (3) RS232 wires to the connector as shown below, or remove the terminal block adapter and plug in a DB-9 male RS232 cable directly to the RS232 connector on the interface.

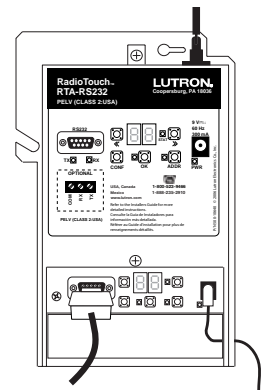
For 7-wire hardware handshaking, you must use the DB-9 cable method.

To select the proper flow control cable for your application, see the Protocol General Notes (page 11).

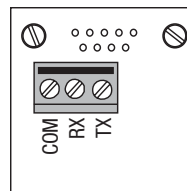
If you are not using the DB-9 cable method, the RS232 cable should enter unit through a knockout hole located on either side of the unit. Place the provided grommet in the knockout hole before wiring.



3-wire connection




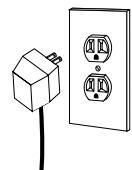
DB-9 connection



COM: Common wire
 RX: Data In (from the host device to the RTA-RS232 interface)
 TX: Data Out (from the RTA-RS232 interface to the host device)

Plug In the Power Supply

 **Danger!** Plug the power supply into a 120 V~ outlet only.



Programming

Determine Zone Types and Numbers

Fill in the table below before beginning to program your *RadioTouch* RS232 Interface.



Note: Leave the completed table below with the building or A/V maintenance group. This information is important in system troubleshooting and reprogramming.

Room Location:			
Zone No.	Zone Description	Zone Type - = Unassigned L = Lights S = Unused C = Contact Closure	LED Display Readout Example
0			
1			
2			
3			
4			
5			
6			
7			
8			
9			

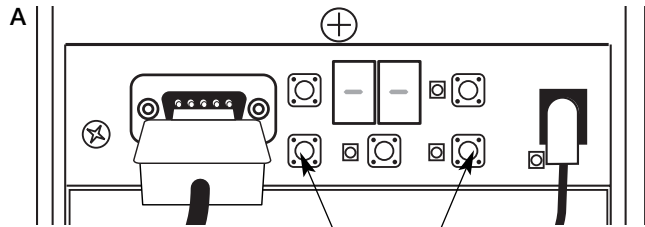
Programming

Configure Zone Types

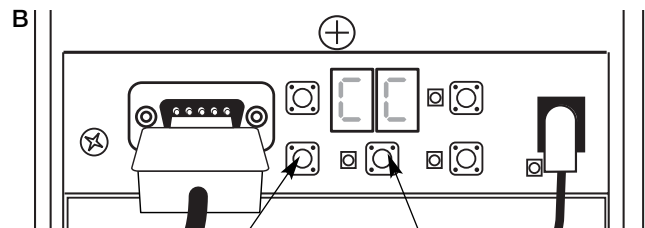
- A. Press and hold the CONF and ADDR buttons for 5 seconds to enter unit configuration mode. The LED display will begin flashing UC to alert you that the unit has entered unit configuration mode.
- B. Press the CONF button repeatedly until the display shows CC. Press the OK button to begin configuring zone types.
- To configure a zone, use the table you filled in on the previous page.
- C. Use the left scroll button to select the zone number you wish to program. Use the right scroll button to select the correct zone type (L, -, or C).
- D. Once the correct zone number and type are displayed, press OK to confirm the setting. The three LEDs will flash to alert you that the change has been made.

Repeat these steps until all your zones have been configured.

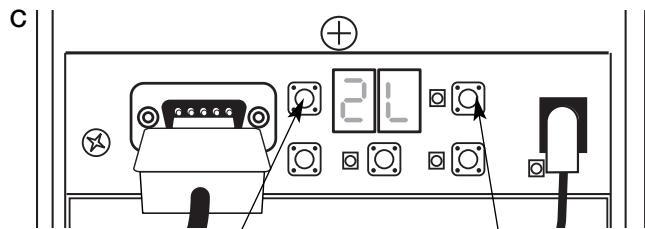
Press and hold the CONF and ADDR buttons for 5 seconds to exit unit configuration mode.



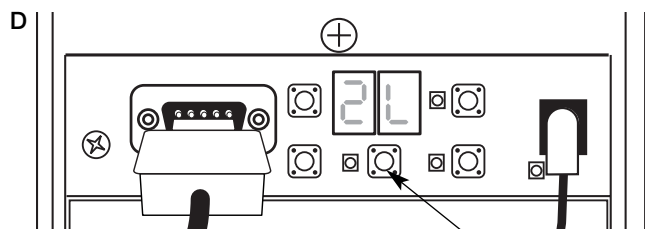
Press and hold for 5 seconds to enter or exit unit configuration mode.



Press CONF until the display shows CC. Then press OK.



Use the left scroll button to change the zone number. Use the right scroll button to change the zone type.



Press OK to confirm this zone setting, then use the scroll buttons to set the next zone.

Programming

Add a Zone

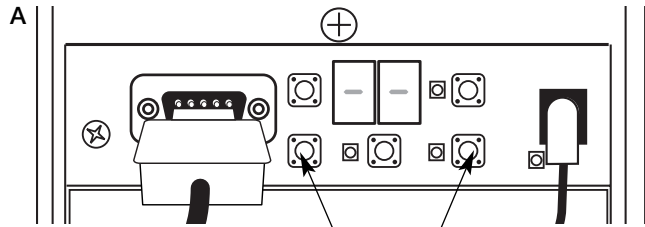
- A. Press and hold the CONF and ADDR buttons for 5 seconds to enter unit configuration mode. The LED display will begin flashing UC to alert you that the unit has entered unit configuration mode.
- B. Press the CONF button repeatedly until the display shows AS. Press the OK button to begin addressing zones.
- C. To add a zone, press the left scroll button until the zone number you wish to address is displayed. Press the ADDR button and the display will show P with the zone number to be programmed, and the ADDR LED will turn on.
- D. On the *RadioTouch* controller you wish to add to the RS232 interface zone, press and release the PROG button. The lights will cycle up and down for 3 seconds to notify you that you are in programming mode, and settle at 50% light output. If you are using an RTA-RX-SW, the lights will cycle off and on. The Status LED on the controller will be in fast blink mode. If no lights are connected to this controller, the status LED will be your only feedback.
- E. On the RS232 interface, press and hold the left scroll and OK buttons for 5 seconds. When the controller has added the RS232 zone, the lights will flash or cycle off and on. If no lights are connected to this controller, hold the buttons until the 3 LEDs around the display flash (approximately 5 seconds).

Note: To add a zone to an RTA-RS232 interface shipped before August 2002 (date code K31), press and hold the **right** scroll and OK buttons instead.

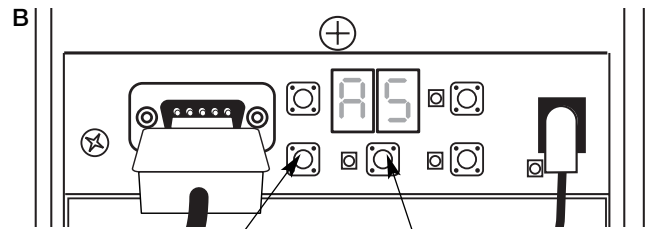
On the controller, press the PROG button to exit program mode. The lights will go to high end, and the STAT LED will return to slow blink mode. If you are using an RTA-RX-SW, the lights will cycle off and on.

Repeat these steps for any other controllers that should be controlled by this zone of the RS232 interface.

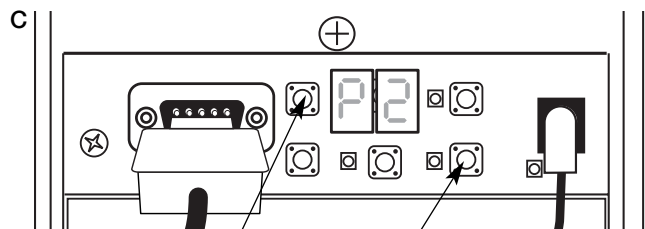
Press and hold the CONF and ADDR buttons for 5 seconds to exit unit configuration mode. The display will start to sequence (approximately 5 seconds).



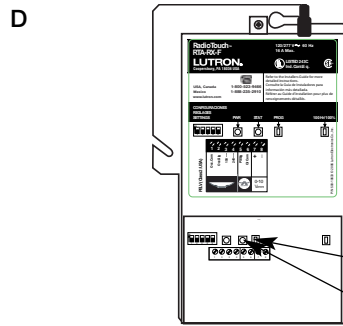
Press and hold for 5 seconds to enter or exit unit configuration mode.



Press CONF until the LED display reads AS. Then press OK.



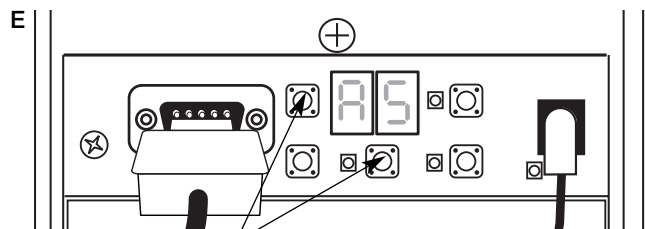
Press the left scroll button to display the desired zone number. Press ADDR to display P in the left window and light the ADDR LED.



RadioTouch controller (this step only)

PROG button

Status LED



Press and hold the left scroll and OK buttons on the interface for 5 seconds.

Programming

Set Data Flow Control Method

No flow control is the default for the RS232 Interface. If you are using no flow control, you have completed the Start-Up of the RS232 Interface.

If you are using full seven-wire hardware handshaking or three-wire software flow control, continue with this step.

A. Enter unit configuration mode by pressing and holding the CONF and ADDR buttons for 5 seconds. The LED display will begin flashing UC when the unit has entered unit configuration mode.

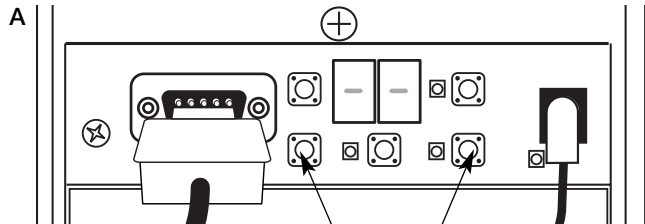
B. Press the CONF button repeatedly until the display shows HS, then press the OK button and the current flow control setting will be displayed on the right LED display.

C. Press the right scroll button to select between S (software flow control), H (hardware handshaking), and – (no flow control).

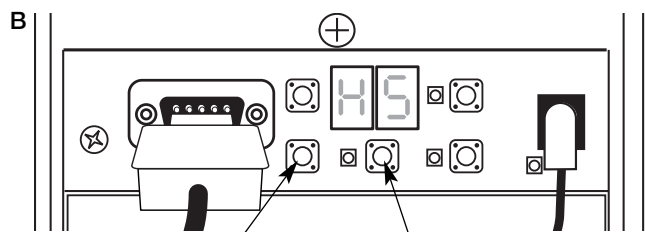
When the desired letter is displayed, press the OK button to confirm this setting. The 3 LEDs around the display will flash to signal the change has been made.

Note: Pressing the left scroll button will display the current configuration for this mode.

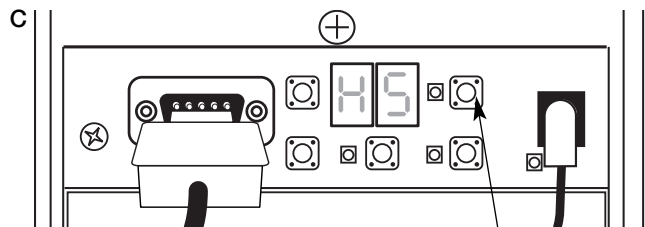
Exit unit configuration mode by pressing and holding the CONF and ADDR buttons for 5 seconds until the display starts to sequence.



Press and hold for 5 seconds to enter or exit unit configuration mode.



Press CONF until the LED display reads HS. Then press OK.



Use the right scroll button to change the data flow control method.

Protocol

General Notes

This section describes the commands available to control a *RadioTouch* system via the *RadioTouch* RS232 interface, model number RTA-RS232.

Communication Settings

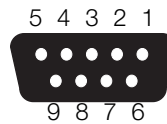
To configure your device to talk to the *RadioTouch* RTA-RS232 interface, use the data conventions listed below.

9600 BAUD
 8 Data Bits
 1 Stop Bit
 No Parity

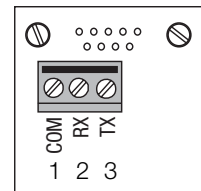
For definition purposes, the host is considered the Data Terminal Equipment (DTE) and the RTA-RS232 is considered the Data Communications Equipment (DCE).

Typical Interface Wiring

The RTA-RS232 is designed to accept a standard 9-pin serial cable to interface to the host. The RTA-RS232 also includes an adapter that allows terminal block connections to the RTA-RS232. This adapter is for use with software flow control or no flow control only. The following table describes each connection scheme.



Female DB-9 pinout for RS232 interface



Terminal block connections for RS232 interface

Pin Name	Description	DB-9 Serial Cable Pin Connection	RTA-RS232 Terminal Block Connection
DCD	Data carrier detect (not used)	1	-
RX	Host data in/RTA-RS232 data out	2	3
TX	Host data out/RTA-RS232 data in	3	2
DTR	Data terminal ready	4	-
GND	Ground/Common	5	1
DSR	Data set ready	6	-
RTS	Request to send	7	-
CTS	Clear to send	8	-
RI	Ring indicator (not used)	9	-

Protocol (continued)

Zones

A zone is an accessory or group of accessories, such as lights or *Sivoia QED* controllable shades, controlled simultaneously as a single unit. The RS232 interface can control up to 10 zones, numbered 0 through 9. Each zone can be configured as lights or contact closures. As shades are controlled by a RF controller's contact closure outputs, shade zones are configured as contact closures zones.

Functions

The following functions are available through the RTA-RS232.

Setting Lighting Zone Levels

Lighting zone level refers to the intensity of the light. The zone may be set to an explicit level, a preset level, or raised/lowered. The explicit levels include a continuous range, or a specific level. See page 15 for a complete description of each explicit level.

For a continuous range, a value of 0 indicates off; a value between 1 and 100 represents intensity, in percent, between low end and high end.

There are a total of 16 presets available. Preset light intensities are stored in the RF controller. When an RF controller receives a Preset command, it adjusts its light intensity to the value stored in the Preset.

When the RTA-RS232 receives a command to raise or lower the zone intensity, it commands the intended zone to raise (lower) its intensity for 5 seconds, or until it receives the ESTP (End Step) command.

Controlling Contact Closures

Contact closure zones respond only to preset levels. Any other type of level will result in an error. When a contact closure zone receives a preset command, it will activate the switch closure associated with that preset for 250 milliseconds. If the preset number is greater than 5, it will ignore the data and send an error message if the unit is in Reply Back Mode.

Setting Presets

The preset light level for a lighting zone may be set via the RTA-RS232. In order to do this, however, DIP Switch 1 on the RF controller in the intended zone must be in the down position or the zone must have received the enter Preset Adjust Mode from the RS232 interface or one of the transmitters in the room. Once this is done, any or all the presets for that zone may be set. Once the presets are set, the DIP Switch on the RF Controller must be placed in the up position or the exit Preset Adjust Mode command must be sent.

System Configuration

When setting the RTA-RS232 configurations, the host must first enter Configuration Mode. After completing the configurations, the host must then exit Configuration Mode. If the system is in Configuration Mode, the only commands that the RTA-RS232 will execute are Configuration commands. All other commands will be ignored. Conversely, if the RTA-RS232 is not in Configuration Mode, it will ignore Configuration Commands.

Zones

Zones may be configured as one and only one of the following: Lights, Contact Closures, or Unassigned. There are a total of 10 zones available on the RS232 interface, numbered 0-9. These zones may be configured either by software control over the data link, or manually using the programming buttons on the RTA-RS232 unit. The default zone configuration is Unassigned.

Reply Back

The RTA-RS232 has the ability to reply to the host whether it processed the last command successfully or not. This mode can be turned on or off. If Reply Back is turned on, and the RTA-RS232 successfully processes a command, the RTA-RS232 will respond to the host with:

~OK<CR>

Protocol (continued)

In addition, if the RTA-RS232 is in Configuration Mode and Reply Back Mode is on, the RTA-RS232 will echo back the last command upon successful completion. For instance, if Zone 1 is to be configured as lights; the following data is transferred

```
Host      :CON,TYPE,1,L<CR>
RTA-RS232 ~CON,RPT,TYPE,1,L<CR>
```

If the command is not successfully processed by the RTA-RS232, it will respond to the host with:

```
~ERROR,error number<CR>
```

See Error Codes on page 15 for a list of error numbers and error descriptions. The default setting for Reply Back Mode is ON.

Acknowledge

The RTA-RS232 has the ability to inform the host when it has completed RF transmission of an RS232 command. This mode can be turned on or off. After completing RF transmission, the RTA-RS232 will respond to the host with:

```
~ACK<CR>
```

The default setting for Acknowledge Mode is OFF.

ADD/DELETE RTA-RS232

Each utilized zone of the RTA-RS232 needs to be addressed to the RF controller(s) it is intended to control. See the *RadioTouch* Installer's Guide for information on addressing.

Data Flow Control

The RTA-RS232 Interface can only accept one command at a time. When it is done processing this command, it will inform the host it is ready to receive more data. The method by which it informs the host depends whether it is using Hardware Handshaking, Software Flow Control or No Flow Control.

Hardware Handshaking

The RadioTouch™ RS232 interface supports full hardware handshaking. In this mode, the system utilizes TX, RX, CTS, RTS, DTR, DSR, and Ground.

Software Flow Control

If hardware handshaking is not being used, care must be taken to ensure all messages are captured. Once the Host issues a command, it cannot issue another one until the RTA-RS232 issues a prompt "!" (ASCII 33d).

No Flow Control

In No Flow Control Mode the RTA-RS232 will not provide any indication that it is able to receive more data from the host. In order to prevent messages from being lost, the host must ensure that each message transmitted to the RTA-RS232 is separated by at least 400ms. No Flow Control is the default setting.

Command Set

General Command Structure

All commands are sent as ASCII characters. Numerical data fields are the ASCII representation of the decimal value.

There should be no spaces between characters. Each command has a prefix, a limited number of fields, and an end character. All commands from the Host device will have a prefix of a colon, :, and an end character of a carriage return, <CR>. All responses from the RTA-RS232, except for the prompt, will have a prefix of a tilde, ~, and end with a carriage return, <CR>. Each field is separated by a comma.

Command Format	:Command,[Parameters],[Extended Parameters]<CR>
:	Indicates start of command
,	Field Separator
Command	Command as shown
Parameters	Zone number or other parameters relevant to the command
Extended Parameters	Parameters that do not apply to all variations of a particular command
<CR>	Carriage Return, ASCII character 13d – indicates end of command

If your equipment does not support the transmission of ASCII characters, you will need to convert the messages from ASCII to whatever form your equipment supports, i.e. hexadecimal. For example, to command the RS-232 Interface to set zone one to preset one, the ASCII text command :PS,1,1<CR> is issued:

ASCII	:	P	S	,	1	,	1	<CR>
Hexadecimal	3A	50	53	2C	31	2C	31	0D

See page 26 for an ASCII to hexadecimal conversion table.

Command Set (continued)

Command Summary

RTA-RS232 Commands

Command	Description	Page
PS	Sets the indicated zone to a predetermined preset level	14
XC	Sets the intended zone to an explicit level between the minimum and maximum levels	15
BSTP	Tells the RTA-RS232 to raise or lower the level for the indicated zone	15
ESTP	Tells the RTA-RS232 to stop raising or lowering the zone level	15
PSA	Tells the indicated zone to enter/exit Preset Adjust mode	15
SPS	Programs the indicated preset level to the current light level	16
PHC	Tells the indicated zone to enter/exit daylight sensor calibration mode	16
PING	Forces a prompt from the RTA-RS232 (used on power-up to start data flow)	16

Configuration Commands

Command	Description	Page
ENTER	Tells the RTA-RS232 to enter Configuration mode	17
EXIT	Tells the RTA-RS232 to exit Configuration mode	17
TYPE	Sets the zone type to Lights, Contact Closures, or Unassigned	17
RB	Tells the RTA-RS232 to turn Reply Back mode on or off	17
ACK	Turns Acknowledgment mode on or off	17
ADD	Adds the RTA-RS232 to an RF controller	18
DELETE	Deletes the RTA-RS232 from an RF controller	18
RPT	Allows the host to query the configuration settings of the RTA-RS232	18

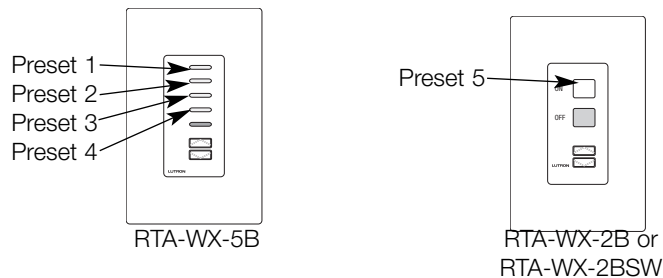
RTA-RS232 Responses

Command	Description	Page
! (PROMPT)	Tells the Host there is room in the RTA-RS232 buffer for another command	19
CON	Informs the host of the current configuration settings	19
ERROR	Provides error codes when an error is detected (Reply Back mode must be on)	19
OK	Responds OK when a command is successfully processed (Reply Back mode must be on)	19
ACK	Issued by the RTA-RS232 when it complete RF transmission of the current command (if Acknowledgment mode is turned on)	19

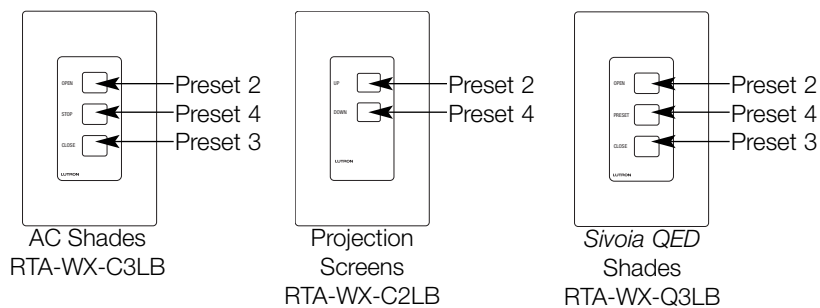
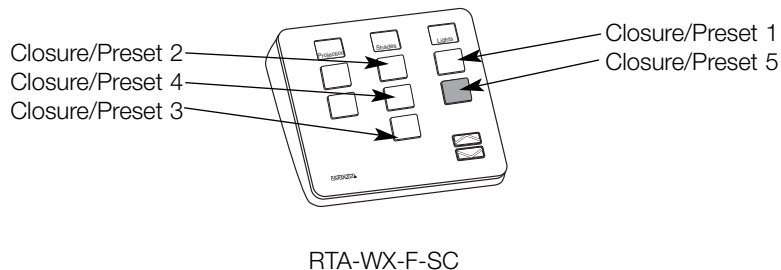
Command Set: RTA-RS232 Commands

Command Name	PS (preset)
Description	Sets the indicated zone to a predetermined preset level
Syntax	:PS,[zone number],[preset number]<CR>
Allowed Values	Zone number: 0 through 9 Preset number: 0 through 16
Example	:PS,6,5<CR> Sets the level for zone 6 to preset level 5

Additional Information **Preset Light Levels:** 16 are available with the RS232 interface. Presets 1 through 5 correspond to buttons on a *RadioTouch* wall control (see below) and will take the RF controller to the same light level as a button press on the wall control. Presets 6 through 8 can be accessed only via the RS232 interface or the RTA-SCI. Presets 9 through 16 can be accessed only via the RS232 interface.



Preset Contact Closures: 5 are available on a RTA-RX-F-SC controller and can be accessed with the RS232 interface using presets 1 through 5. Contact closure outputs are primarily used to control *Sivoia QED* controllable window treatments, AC motorized shades, and projection screens.



Note: Press any button (or activate any preset) when *Sivoia QED* shades are moving to stop them where they are.

Command Set: RTA-RS232 Commands

Command Name XC (explicit)
Description Sets the indicated zone to an explicit level between the minimum and maximum levels. Applies to lighting zones only.
Syntax :XC,[zone number],[level]<CR>
Allowed Values Zone number: 0 through 9
 Level: 0 through 100; or command from table below
Examples :XC,1,57<CR> Sets the level for zone 1 to 57%
 :XC,4,OFF<CR> Turns zone 4 off

Additional Information

Explicit Zone Levels	
Level/Command	Description
0 - 100	Light intensity in percent; 0 = off
ONLAST	If zone is off, sets to previous level If zone is on, stays at current level
OFF	Turns lights off (0%)

Command Name BSTP (begin step)
Description Raises or lowers the level for the indicated zone.
Syntax :BSTP,[zone number],[step type]<CR>
Allowed Values Zone number: 0 through 9
 Step type: RAISE or LOWER
Example :BSTP,9,RAISE<CR> Tells zone 9 to raise

Additional Information The RTA-RS232 will continuously raise or lower the zone level until it receives the end step command (ESTP), or until it times out. The timeout period for lighting zones is 5 seconds.
 Note: If the zone is currently off, RAISE will turn the zone on. The LOWER command will not turn a zone off; the zone will reduce to minimum level. Only one zone can raise or lower at a time, and no other commands may be executed while that zone is raising or lowering.

Command Name ESTP (end step)
Description Stops raising or lowering the level for the current zone.
Syntax :ESTP<CR>
Allowed Values N/A
Example :ESTP<CR> Stops raising or lowering a zone level

Additional Information This command must follow BSTP to tell the zone to stop raising/lowering.

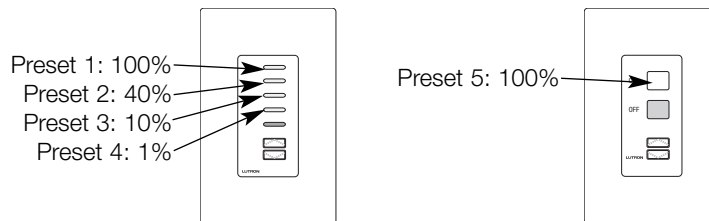
Command Name PSA (preset adjust mode)
Description Tells the indicated zone to enter or exit preset adjust mode.
Syntax :PSA, [zone number], [action type]<CR>
Allowed Values Zone number: 0 through 9
 Action type: ENTER or EXIT
Example :PSA,4,ENTER<CR> Tells zone 4 to enter preset adjust mode

Additional Information While in preset adjust mode, *RadioTouch* controllers will not respond to preset commands.

Command Set: RTA-RS232 Commands

Command Name	SPS (set preset)
Description	Programs the preset value to the current light level.
Syntax	:SPS,[zone number],[preset number]<CR>
Allowed Values	Zone number: 0 through 9 Preset number: 1 through 16
Example	:SPS,4,3<CR> Programs preset 3 on zone 4

Additional Information To program a preset, either DIP switch 1 on the *RadioTouch* controller must be in the down position, or the PSA (enter preset adjust mode) command must have already been sent. Refer to the *RadioTouch* Installer's Guide for more details on programming presets. This command need only be sent once to program a preset. **Note:** Any changes to presets 1 through 5 will be mimicked in all *RadioTouch* transmitters in the room. If this is undesirable, use presets 6 through 16. The default light intensities for presets 1 through 5 on the RF controllers are as follows:



Command Name	PHC (daylight sensor calibration mode)
Description	Tells the intended zone to enter or exit daylight sensor calibration mode..
Syntax	:PHC,[zone number],[action type]<CR>
Allowed Values	Zone number: 0 through 9 Action type: ENTER or EXIT
Example	:PHC,7,ENTER<CR> Tells zone 7 to enter daylight sensor calibration mode

Additional Information While in daylight sensor mode, *RadioTouch* controllers will not respond to preset commands.

Command Name	PING
Description	Forces a prompt from the RTA-RS232 (used on power-up to start data flow).
Syntax	:PING<CR>
Allowed Values	N/A
Example	:PING<CR> Sends the PING command to the RTA-RS232
Response	!<CR> Reply from the RTA-RS232

Additional Information This command is used in the event that the RTA-RS232 powers up before the Host and the data flow control is set to Software. In this case, the Host will miss the initial Prompt that the RTA-RS232 issues at power up. It is possible that the host will then wait for a prompt, and will never receive one. The PING command is a nonintrusive way to kick-start data flow. When the RTA-RS232 receives the PING command, it simply responds with a PROMPT.

Command Set: Configuration Commands

The following commands will configure the RTA-RS232 product. Each is prefixed with the CON command.



When setting the RTA-RS232 configurations, the host must first enter configuration mode on the RTA-RS232. After completing the configurations, the host must then exit configuration mode on the RTA-RS232. If the system is in configuration mode, the only commands that the RTA-RS232 will execute are configuration commands. All other commands will be ignored. Conversely, if the RTA-RS232 is not in configuration mode, it will ignore all configuration commands.

Command Name	ENTER/EXIT (enter or exit configuration mode)
Description	Tells the RTA-RS232 to enter or exit configuration mode.
Syntax	:CON,[command]<CR>
Allowed Values	Command: ENTER or EXIT
Example	:CON,ENTER<CR> Tells the RTA-RS232 to enter configuration mode

Additional Information	The ENTER command must be executed to set RTA-RS232 configurations; the EXIT command must be executed after the configuration is complete. When the system is in configuration mode, the only commands the RTA-RS232 will execute are configuration commands.
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Command Name	TYPE (set zone type)
Description	Sets the zone type to lights (L), contact closures (C), or unassigned (-).
Syntax	:CON,TYPE,[zone number],[type]<CR>
Allowed Values	Zone number: 0 through 9 Type: L (lighting zone), C (contact closure zone), or - (unassigned)
Example	:CON,TYPE,5,L<CR> Sets zone 5 as a lighting zone

Additional Information	Type S is an unused zone type; do not use.
-------------------------------	--

Command Name	RB (reply back mode)
Description	Turns reply back mode on or off.
Syntax	:CON,RB,[status]<CR>
Allowed Values	Status: ON or OFF
Example	:CON,RB,ON<CR> Turns reply back mode on

Additional Information	The default state of reply back mode is on.
-------------------------------	---

Command Name	ACK (acknowledgment mode)
Description	Turns acknowledgment mode on or off.
Syntax	:CON,ACK, [status]<CR>
Allowed Values	Status: ON or OFF
Example	:CON,ACK,ON<CR> Turns acknowledgment mode on

Additional Information	The default state of acknowledgment mode is off.
-------------------------------	--

Command Set: Configuration Commands

Command Name	ADD/DELETE (add or delete the interface from a controller)
Description	Adds or deletes the RTA-RS232 to a <i>RadioTouch</i> controller.
Syntax	:CON,[function],[zone number]<CR>
Allowed Values	Function: ADD or DELETE Zone number: 0 through 9
Example	:CON,ADD,5<CR> Adds zone 5 of the RTA-RS232 to the controller
Additional Information	To add or delete the RTA-RS232, each controller must be in program mode. See the <i>RadioTouch</i> Installer's Guide for more details.

Command Name	RPT (report configuration settings)
Description	Allows the host to query configuration settings for the RTA-RS232 interface.
Syntax	:CON,RPT,[category],[parameter]<CR>
Allowed Values	Category: TYPE Zone type HAND Data flow control configuration RB Reply back mode ACK Acknowledgement mode REV Software revision Parameter: 0 - 9 Desired zone (applies only to TYPE) M Master microprocessor (applies only to REV) S Satellite microprocessor (applies only to REV)
Examples	:CON,RPT,TYPE,2<CR> Requests zone configuration for zone 2 :CON,RPT,RB<CR> Requests the status of reply back mode
Additional Information	Parameter can be omitted if not applicable. See page 19 for RTA-RS232 responses to configuration queries.

Command Set: RTA-RS232 Responses

Command Name	PROMPT
Description	Tells the host the RTA-RS232 is ready to receive another command.
Syntax	!<CR>
Additional Information	Once the host issues a command, it must wait for a prompt from the RTA-RS232 before sending another command.

Command Name	CON (configuration reports)																		
Description	Inform the host of the current settings.																		
Syntax	~CON,RPT,[category],[zone number],[data]<CR>																		
Allowed Values	<table><thead><tr><th>Category</th><th>Zone Number</th><th>Data</th></tr></thead><tbody><tr><td>TYPE</td><td>0 - 9</td><td>L, C, -</td></tr><tr><td>HAND</td><td></td><td>HW, SW</td></tr><tr><td>RB</td><td></td><td>ON, OFF</td></tr><tr><td>ACK</td><td></td><td>ON, OFF</td></tr><tr><td>REV</td><td>#. #</td><td></td></tr></tbody></table>	Category	Zone Number	Data	TYPE	0 - 9	L, C, -	HAND		HW, SW	RB		ON, OFF	ACK		ON, OFF	REV	#. #	
Category	Zone Number	Data																	
TYPE	0 - 9	L, C, -																	
HAND		HW, SW																	
RB		ON, OFF																	
ACK		ON, OFF																	
REV	#. #																		
Examples	<table><tbody><tr><td>~CON,RPT,TYPE,2,L<CR></td><td>Indicates zone 2 is configured as lights</td></tr><tr><td>~CON,RPT,RB,ON<CR></td><td>Indicates reply back mode is on</td></tr><tr><td>~CON,RPT,REV,3.2<CR></td><td>Indicates software revision level is 3.2</td></tr></tbody></table>	~CON,RPT,TYPE,2,L<CR>	Indicates zone 2 is configured as lights	~CON,RPT,RB,ON<CR>	Indicates reply back mode is on	~CON,RPT,REV,3.2<CR>	Indicates software revision level is 3.2												
~CON,RPT,TYPE,2,L<CR>	Indicates zone 2 is configured as lights																		
~CON,RPT,RB,ON<CR>	Indicates reply back mode is on																		
~CON,RPT,REV,3.2<CR>	Indicates software revision level is 3.2																		
Additional Information	Zone number may be omitted if not applicable. See page 18 for the RPT command.																		

Command Name	ERROR (error codes)																		
Description	The RTA-RS232 provides an error code when an error is detected.																		
Syntax	~ERROR,[err #]<CR>																		
Allowed Values	<table><tbody><tr><td>Err #:</td><td>1</td><td>Non-configuration command sent while in configuration mode</td></tr><tr><td></td><td>2</td><td>Invalid command</td></tr><tr><td></td><td>3</td><td>Wrong zone type</td></tr><tr><td></td><td>4</td><td>Buffer full</td></tr><tr><td></td><td>5</td><td>Bad EEPROM</td></tr><tr><td></td><td>6</td><td>Configuration command sent while not in configuration mode</td></tr></tbody></table>	Err #:	1	Non-configuration command sent while in configuration mode		2	Invalid command		3	Wrong zone type		4	Buffer full		5	Bad EEPROM		6	Configuration command sent while not in configuration mode
Err #:	1	Non-configuration command sent while in configuration mode																	
	2	Invalid command																	
	3	Wrong zone type																	
	4	Buffer full																	
	5	Bad EEPROM																	
	6	Configuration command sent while not in configuration mode																	
Example	~ERROR,2<CR> Last command processed was invalid (syntax or range)																		

Command Name	OK
Description	The RTA-RS232 informs the host a command was successfully processed.
Example	:PS,6,5<CR> Host requests that level for zone 6 be set to preset level 5 ~OK<CR> Response from RTA-RS232 indicates command was successfully processed.

Command Name	ACK
Description	RTA-RS232 informs the host when it has completed transmission of the current command.
Example	:PS,6,5<CR> Host requests that level for zone 6 be set to preset level 5 ~ACK<CR> Response from RTA-RS232 indicates transmission of current command was completed.
Additional Information	The default state of acknowledgment mode is off; it must be turned on (see page 17) for the RTA-RS232 to issue this response..

Advanced Programming

Delete a Zone on the RS232 Interface from a *RadioTouch* Controller

Press and hold the CONF and ADDR buttons for 5 seconds to enter unit configuration mode. The LED display will begin flashing UC to alert you that the unit has entered unit configuration mode.

Press the CONF button repeatedly until the display shows AS. Press the OK button to begin deleting zones.

To delete a zone, press the left scroll button until the zone number you wish to delete is displayed. Press the ADDR button and the display will show P with the zone number to be programmed, and the ADDR LED will turn on.

On the *RadioTouch* controller you wish to delete from the RS232 interface zone, press and release the PROG button. The lights will cycle up and down for 3 seconds to notify you that you are in programming mode, and settle at 50% light output. If you are using an RTA-RX-SW, the lights will cycle off and on. The Status LED on the controller will be in fast blink mode. If no lights are connected to this controller, the status LED will be your only feedback.

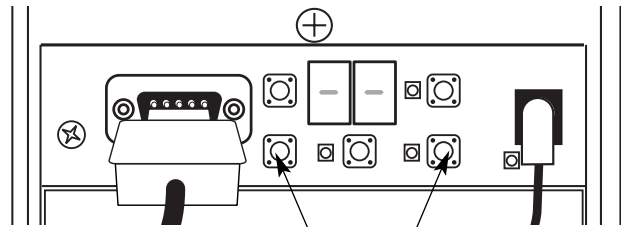
On the RS232 interface, press and hold the right scroll and OK buttons for 5 seconds. When the controller has deleted the RS232 zone, the lights will flash or cycle off and on. If no lights are connected to this controller, hold the buttons until the 3 LEDs around the display flash (approximately 5 seconds).

Note: To delete a zone from an RTA-RS232 interface shipped before August 2002 (date code K31), press and hold the **left** scroll and OK buttons.

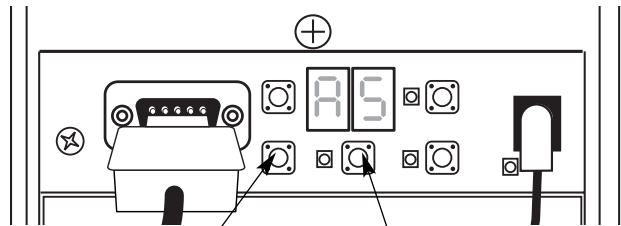
On the controller, press the PROG button to exit program mode. The lights will go to high end, and the STAT LED will return to slow blink mode. If you are using an RTA-RX-SW, the lights will cycle off and on.

Repeat these steps to delete additional zones from this RS232 interface.

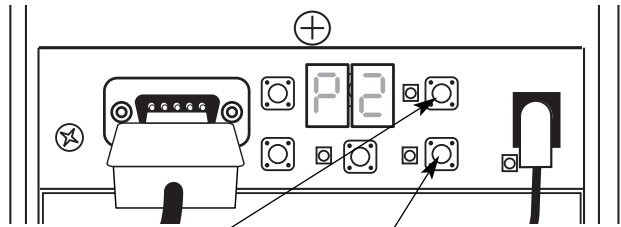
Press and hold the CONF and ADDR buttons for 5 seconds to exit unit configuration mode. The display will start to sequence (approximately 5 seconds).



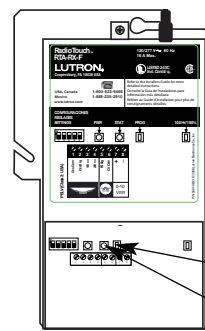
Press and hold for 5 seconds to enter or exit unit configuration mode.



Press CONF until the LED display reads AS. Then press OK.

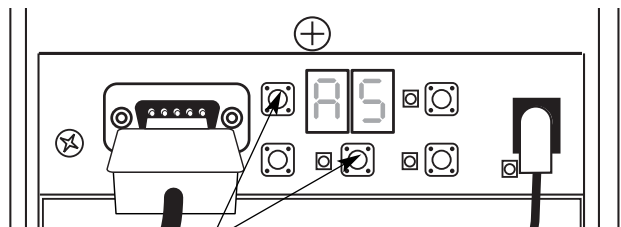


Press the right scroll button to display the desired zone number. Press ADDR to display P in the left window and light the ADDR LED.



RadioTouch controller (this step only)

PROG button
Status LED



Press and hold the right scroll and OK buttons on the interface for 5 seconds.

Advanced Programming (continued)

Modify Reply Back Settings

The default mode is for the RS232 interface to send OK and error messages back to the host device. If your device is unable to process this information, continue with this section to turn Reply Back messages OFF.

Press and hold the CONF and ADDR buttons for 5 seconds to enter unit configuration mode. The LED display will begin flashing UC to alert you that the unit has entered unit configuration mode.

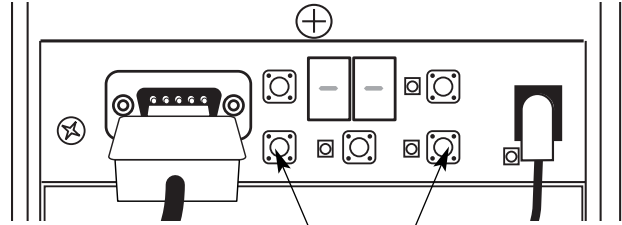
Press the CONF button repeatedly until the display shows rb. Press the OK button to display the current setting on the right LED display.

Press the right scroll button to select between 1 (Reply Back mode ON) and 0 (Reply Back mode OFF).

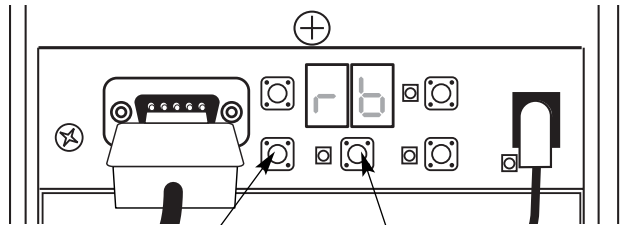
Press OK to confirm the setting you require. The 3 LEDs around the display will flash to signal the change has been made.

Note: Pressing the left scroll button will display the current configuration for this mode.

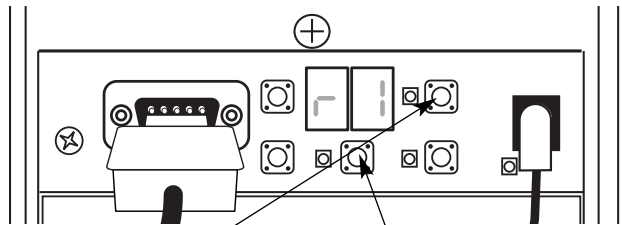
Press and hold the CONF and ADDR buttons for 5 seconds to exit unit configuration mode. The display will start to sequence (approximately 5 seconds).



Press and hold for 5 seconds to enter or exit unit configuration mode.



Press CONF until the LED display reads rb. Then press OK.



Press the right scroll button to select the mode. Then press OK.

Advanced Programming (continued)

Modify Acknowledgment Settings

The Acknowledgment setting should remain OFF unless you have a special requirement to control multiple rooms from a master host device. In this mode an ACK will be returned when a command has been completely sent via RF from the desired interface. If you need to use this feature, contact Lutron Technical Support at 1-800-523-9466 for more details, then continue with this section.

Press and hold the CONF and ADDR buttons for 5 seconds to enter unit configuration mode. The LED display will begin flashing UC to alert you that the unit has entered unit configuration mode.

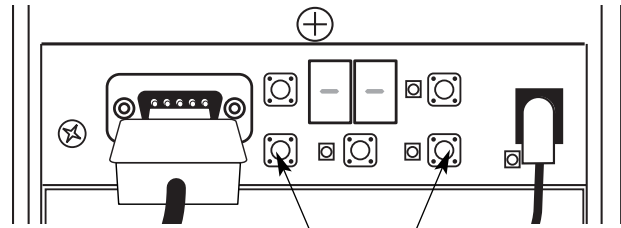
Press the CONF button repeatedly until the display shows AC. Press the OK button to display the current setting on the right LED display.

Press the right scroll button to select between 1 (Acknowledge mode ON) and 0 (Acknowledge mode OFF).

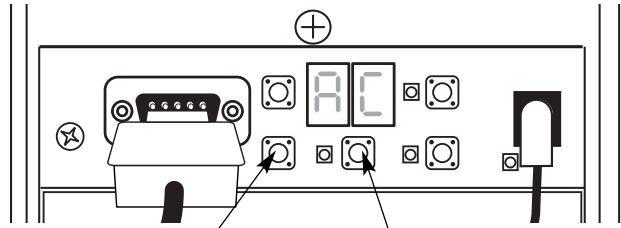
Press OK to confirm the setting you require. The 3 LEDs around the display will flash to signal the change has been made.

Note: Pressing the left scroll button will display the current configuration for this mode.

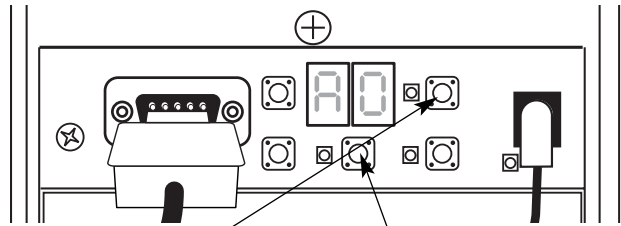
Press and hold the CONF and ADDR buttons for 5 seconds to exit unit configuration mode. The display will start to sequence (approximately 5 seconds).



Press and hold for 5 seconds to enter or exit unit configuration mode.



Press CONF until the LED display reads AC. Then press OK.



Press the right scroll button to select the mode. Then press OK.

Operation

Set Up Scenes (accessed from Tabletop/Wall Control, single zone type)

It is very easy to generate scenes composed of zones of lights. These scenes can be easily accessed and modified from tabletop or wall controls.

Example:

A room has the following lighting zones addressed to the RTA-RS232 interface:

Zone Description	Level for New Scene
0 Front lights	25%
1 Rear lights	80%
2 Wall washers	50%

Select an unused lighting zone on the RTA-RS232 to contain the scene. This zone should have no controllers addressed to it that are not part of the scene.

To configure the zone, enter configuration mode, and set the zone type (in this example, zone 9 will be configured to Lights).

Note: Feedback from the RTA-RS232 (prefixed with a tilde/~) will occur only if the RTA-RS232 has Reply Back Mode turned ON.

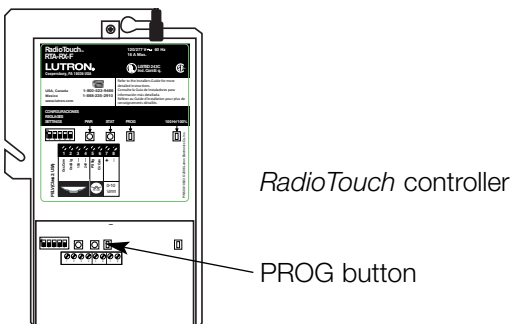
Enter Configuration Mode:

Host sends :CON,ENTER<CR>
RS232 replies ~CON,RPT,ENTER

Configure Zone as Lights:

Host sends :CON,TYPE,9,L<CR>
RS232 replies ~CON,RPT,TYPE,9,L

To add the target zone to the RF controllers, place each controller in the scene in Program Mode by pressing its programming button. See the *RadioTouch Installer's Guide* for information on addressing. Each controller can be addressed to the target zone at the same time.



Issue the ADD Command:

Host sends :CON,ADD,9<CR>
RS232 replies ~OK

Exit Configuration Mode:

Host sends :CON,EXIT<CR>
RS232 replies ~CON,RPT,EXIT

Take each controller out of Program Mode by pressing its programming button.

Verify that the controllers have been addressed to zone 9 by turning zone 9 OFF, then ON.

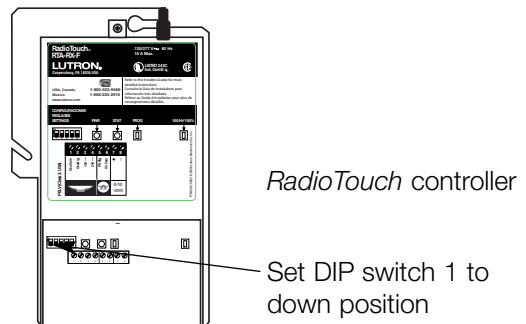
Host sends :XC,9,OFF<CR>
RS232 replies ~OK

The lights should go OFF for all intended zones.

Host sends :XC,9,100<CR>
RS232 replies ~OK

The lights should go ON for all intended zones.

To adjust the lights to the desired levels for the new scene, enter Preset Adjust mode. Either use the PSA command, or put DIP switch 1 on each controller in the down position.



Enter Preset or Adjust Mode:

Host sends :PSA,9,ENTER<CR>
RS232 replies ~OK

Adjust each zone to the desired level either by issuing explicit commands, or by using RAISE/LOWER. Presets cannot be used to adjust the light intensity.

Explicit Level Command for Each Zone:

Host sends :XC,0,25<CR>
RS232 replies ~OK

Host sends :XC,1,80<CR>
RS232 replies ~OK

Host sends :XC,2,50<CR>
RS232 replies ~OK

Operation (continued)

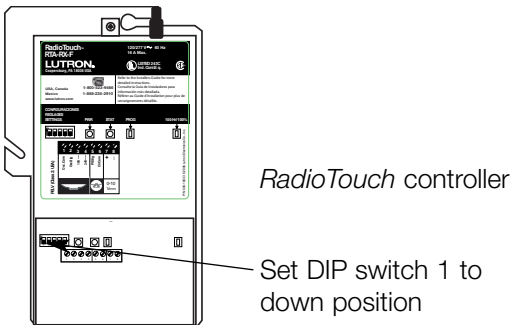
Select a preset to store the lighting levels for the new scene. Using presets 1 through 5 will allow the presets to be accessed and modified from a tabletop or wall control. Once a preset has been selected, save the current scene levels to that preset.

For this example, we will use preset 4.

Issue the Set Preset Command:

Host sends :SPS,9,4<CR>
RS232 replies ~OK

Return DIP switch 1 to the up position on each controller, or issue Preset Adjust Mode Exit command.



Exit Preset or Adjust Mode:

Host sends :PSA,9,EXIT<CR>
RS232 replies ~OK

The scene has now been programmed. Recall the scene by issuing a Preset command for the Zone that contains the scene.

In this example, the scene was stored in zone 9, preset 4.

To Recall the Scene with the Preset Command:

Host sends :PS,9,4<CR>
RS232 replies ~OK

If another scene containing the same lighting zones is desired, the same process can be used as above, selecting a different preset. If a scene containing different lighting zones is desired, the same process can be used, selecting a different zone on the RTA-RS232 and a different preset.

Set Up Scenes (not accessed from Tabletop/Wall Control, multiple zone types)

It is possible to generate scenes that cannot be accessed from other Tabletop or Wall Controls in the system or that contain different zone types, i.e. Lights and *Sivoia QED* shades (contact closure zone type). However, to recall the scene, more than one command must be issued. To set the scene, multiple explicit commands will be issued.

Example:

A room has the following lighting zones addressed to the RTA-RS232 interface:

Zone Description	Level for New Scene
0 Front lights	25%
1 Rear lights	80%
2 Wall washers	50%
3 Shades	Open

To accomplish this you will need to send the following command lines in rapid succession:

Host sends :XC,0,25<CR>
RS232 replies ~OK

Host sends :XC,1,80<CR>
RS232 replies ~OK:

Host sends :XC,2,50<CR>
RS232 replies ~OK

Host sends :PS,3,3<CR>
RS232 replies ~OK

Troubleshooting

Symptom	Possible Cause(s)	Solution
The unit does not power up (the power LED does not light up).	Loss of power.	Check circuit breaker and connection at unit.
	Faulty power supply.	Verify power supply is operating properly.
The RS232 interface does not communicate with the host.	Communication cable is miswired.	Verify the pinout on the cable, rewire if necessary.
	Communications cable is loose.	Check cable connections.
	Data flow control settings for the two devices are not the same.	Check the data flow control settings for both devices. Make sure both are set to desired setting.
	Improper communications settings	Check the communications settings on the host and verify they comply with the RS232 Interface requirements.
	Host has not received "Prompt" from RS232 Interface (SW flow control only).	Have host issue "PING" command to kick-start data flow.
The RS232 interface reacts to host commands, but there is no feedback from the RS232 interface.	Receive line in communications cable is loose.	Check connections on communication cable.
	RB mode is turned off.	Turn RB mode on.
Data flows between the host and the RS232 interface, but the system does not respond.	The RS232 interface is out of range.	Verify the interface is within 35 ft. (10.7 m) of all <i>RadioTouch</i> controllers.
	Zones are not configured properly.	Verify zones are configured for proper zone type (lights or contact closures).
	The RS232 interface is in configuration mode.	Exit configuration mode.
Data flows between the host and the RS232 interface, but the system does not respond as desired (e.g., shade activity instead of light activity).	The rest of the system does not have power.	Apply power to the rest of the system.
	The RS232 zones are not configured properly.	Verify zones are configured for proper zone type (lights or contact closures).

ASCII to Hexadecimal Conversion

ASCII Value	Hexadecimal Value	ASCII Value	Hexadecimal Value	ASCII Value	Hexadecimal Value
NUL (null)	00	0	30	`	60
SOH (start of heading)	01	1	31	a	61
STX (start of text)	02	2	32	b	62
ETX (end of text)	03	3	33	c	63
EOT (end of transmission)	04	4	34	d	64
ENQ (enquiry)	05	5	35	e	65
ACK (acknowledge)	06	6	36	f	66
BEL (bell)	07	7	37	g	67
BS (backspace)	08	8	38	h	68
HT (horizontal tab)	09	9	39	i	69
LF (line feed/new line)	0A	:	3A	j	6A
VT (vertical tab)	0B	;	3B	k	6B
FF (form feed/new page)	0C	<	3C	l	6C
CR (carriage return)	0D	=	3D	m	6D
SO (shift out)	0E	>	3E	n	6E
SI (shift in)	0F	?	3F	o	6F
DLE (data link escape)	10	@	40	p	70
DC1 (device control 1)	11	A	41	q	71
DC2 (device control 2)	12	B	42	r	72
DC3 (device control 3)	13	C	43	s	73
DC4 (device control 4)	14	D	44	t	74
NAK (neg. acknowledge)	15	E	45	u	75
SYN (synchronous idle)	16	F	46	v	76
ETB (end of trans. block)	17	G	47	w	77
CAN (cancel)	18	H	48	x	78
EM (end of medium)	19	I	49	y	79
SUB (substitute)	1A	J	4A	z	7A
ESC (escape)	1B	K	4B	{	7B
FS (file separator)	1C	L	4C		7C
GS (group separator)	1D	M	4D	}	7D
RS (record separator)	1E	N	4E	~	7E
US (unit separator)	1F	O	4F	DEL (delete)	7F
SP (space)	20	P	50		
!	21	Q	51		
“	22	R	52		
#	23	S	53		
\$	24	T	54		
%	25	U	55		
&	26	V	56		
‘	27	W	57		
(28	X	58		
)	29	Y	59		
*	2A	Z	5A		
+	2B	[5B		
,	2C	\	5C		
-	2D]	5D		
.	2E	^	5E		
/	2F	_	5F		

Warranty

Lutron Electronics Co., Inc. One Year Limited Warranty

For a period of one year from the date of purchase, and subject to the exclusions and restrictions described below, Lutron warrants each new unit to be free from manufacturing defects. Lutron will, at its option, either repair the defective unit or issue a credit equal to the purchase price of the defective unit to the Customer against the purchase price of comparable replacement part purchased from Lutron. Replacements for the unit provided by Lutron or, at its sole discretion, an approved vendor may be new, used, repaired, reconditioned, and/or made by a different manufacturer.

If the unit is commissioned by Lutron or a Lutron approved third party as part of a Lutron commissioned lighting control system, the term of this warranty will be extended, and any credits against the cost of replacement parts will be prorated, in accordance with the warranty issued with the commissioned system, except that the term of the unit's warranty term will be measured from the date of its commissioning.

EXCLUSIONS AND RESTRICTIONS

This Warranty does not cover, and Lutron and its suppliers are not responsible for:

1. Damage, malfunction or inoperability diagnosed by Lutron or a Lutron approved third party as caused by normal wear and tear, abuse, misuse, incorrect installation, neglect, accident, interference or environmental factors, such as (a) use of incorrect line voltages, fuses or circuit breakers; (b) failure to install, maintain and operate the unit pursuant to the operating instructions provided by Lutron and the applicable provisions of the National Electrical Code and of the Safety Standards of Underwriter's Laboratories; (c) use of incompatible devices or accessories; (d) improper or insufficient ventilation; (e) unauthorized repairs or adjustments; (f) vandalism; or (g) an act of God, such as fire, lightning, flooding, tornado, earthquake, hurricane or other problems beyond Lutron's control.
2. On-site labor costs to diagnose issues with, and to remove, repair, replace, adjust, reinstall and/or reprogram the unit or any of its components.
3. Equipment and parts external to the unit, including those sold or supplied by Lutron (which may be covered by a separate warranty).
4. The cost of repairing or replacing other property that is damaged when the unit does not work properly, even if the damage was caused by the unit.

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TO MAKE A WARRANTY CLAIM

To make a warranty claim, promptly notify Lutron within the warranty period described above by calling the Lutron Technical Support Center at (800) 523-9466. Lutron, in its sole discretion, will determine what action, if any, is required under this warranty. To better enable Lutron to address a warranty claim, have the unit's serial and model numbers available when making the call. If Lutron, in its sole discretion, determines that an on-site visit or other remedial action is necessary, Lutron may send a Lutron Services Co. representative or coordinate the dispatch of a representative from a Lutron approved vendor to Customer's site, and/or coordinate a warranty service call between Customer and a Lutron approved vendor.

This warranty gives you specific legal rights, and you may also have other rights which vary from state to state. Some states do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.

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