

## MODEL RCL LIGHT SWITCH RESPONDER

### DESCRIPTION

Model RCL Light Switch Responder directly replaces the wall switch to control the lights. It allows the user to turn the lights ON and OFF in the conventional manner by pressing the top of the switch to turn the lights ON and by pressing the bottom of the switch to turn the lights OFF.

Power line carrier signals

(PLC) emanating from a central location of the building can be used to turn the lights off during non-working hours. RCL blinks the lights as a warning that the lights are about to be turned off and the user can obtain a one hour override.

### FEATURES

- This is a direct replacement for the existing wall switch.
- A visible red LED is on when the lighting load is off.
- A light blink is a warning that the lights are about to be turned off.
- The user can obtain a one hour override.

### APPLICATION

The control of lights in a large facility is ordinarily done on a time of day - area by area basis. If the Control System simply turns the lights off during the non-working hours it would be very inconvenient for workers who wish to work late. RCL provides special features to accommodate after-hours work.

The Control System, using an RCL Light Switch Responder lets the employees turn the lights on and off in the normal manner. The lights are turned on by the first employee entering an area and off by the last employee to leave. Unfortunately the last employee to leave does not always remember to turn the lights off.

RCL can be used along with other Functional Devices, Inc. Energy Control System components described in Bulletin A234.

The Control System should be programmed to send a PLC on command during the normal working hours and a PLC off command during the non working hours. RCL can be programmed on a location by location basis by individually addressing the PLC address (ID) of each RCL.

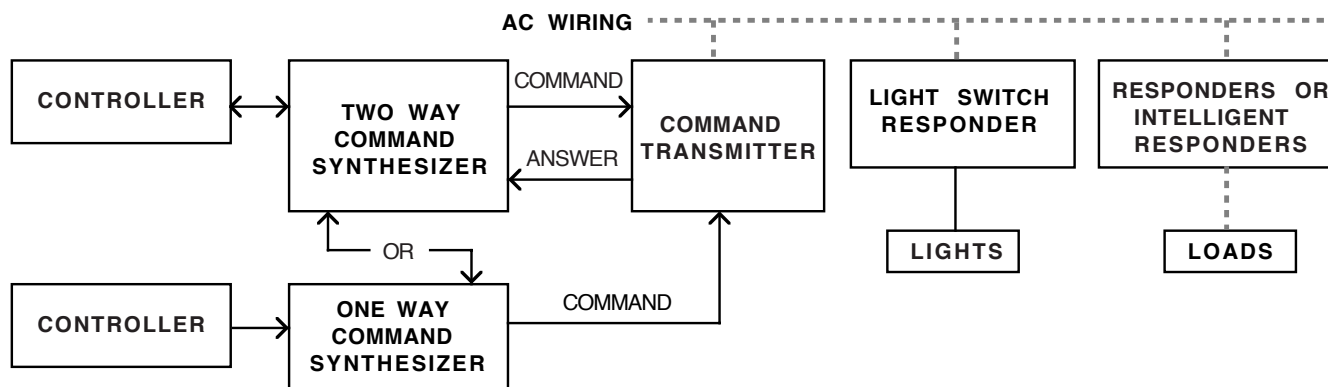
The PLC on command will not turn the lights on and the lights must be turned on by the occupant pressing the top of the RCL when he arrives at his work location (except for models RCL01SN and RCL02SN).

When first receiving the PLC off command, the RCL Light Switch Responder will blink the lights to warn the occupants that the lights will be turned off in five minutes. Following the warning blink the user can obtain an hour override by pressing the top of the switch. If the switch is not pressed, the light will turn off.

At the end of that hour override, the light will blink again and if the occupant does not request another hour delay by pressing the top of the switch, the light will go off. At any time during the hour delay, the occupant can reset the timer to another full hour by pressing the top of the switch.

If an employee enters his work area at a time when work is not scheduled and the lights have been turned off by an employee or by the Control System, he can turn the lights on for an hour by pressing the top of the Light Switch.

In retrofit installations the RCL can be used to replace the existing wall switch with no local additional wiring necessary. It is required that the box containing the wall switch has wires representing an energized line, a line going to the load, an equipment ground and neutral (or another energized line).



**Block Diagram of a Control System using a Light Switch Responder and other Responders**

**CONTROL ALGORITHMS**

1 -- OPERATION IF RCL IS RECEIVING PLC ON COMMANDS  
 If the bottom of the RCL is pressed, the light will go (or remain) off.  
 If the top of the RCL is pressed, the light will go (or remain) on.

2 -- OPERATION IF RCL IS RECEIVING PLC OFF COMMANDS  
 If the bottom of the RCL is pressed, the light will go (or remain) off.  
 If the top of the RCL is pressed, the light will go (or remain) on for one hour. After that time, the light will blink and will go off five minutes after the blink. Any pressing of the top of the RCL will restart the one hour timer.

3 -- PLC COMMAND CHANGES FROM OFF TO ON  
 Except for models RCL01SN & RCL02SN, no action results.  
 In models RCL01SN & RCL02SN, the light will go on.

4 -- PLC COMMAND CHANGES FROM ON TO OFF  
 The light will blink and if the top of RCL is not pressed within five minutes, the light will go off. See 2 above.

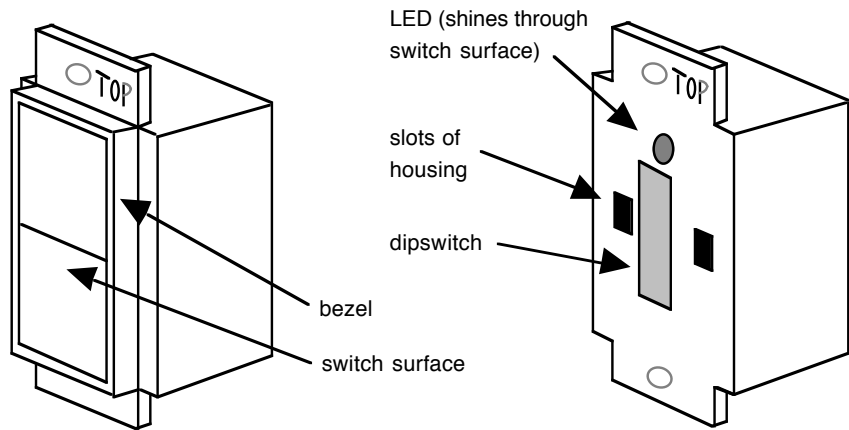
Upon power-up RCL will start in the off condition and will obey the control algorithms listed above.

The blinking of the light can be eliminated by closing dipswitch 10 of the RCL (may be required for high intensity lights or other loads).

To remove bezel & switch surface, lift bottom of bezel slightly and slide bezel & switch surface toward top.

To replace bezel & switch place bezel at a higher position than normal, hook wings of bezel into slots of housing and slide bezel down until it snaps into place.

Then hook one side of the switch surface into bezel and press other side of switch surface into bezel until it snaps into place.



**OPTIONS**

Model numbers beginning with RCL01 are powered by 120 Vac. Model numbers beginning with RCL02 are powered by 208-277 Vac. All model numbers end with / followed by a letter or number which is the PLC channel number. Channel A is the commonly used channel.

Model RCL01S/A and RCL02S/A  
 The PLC on command does not turn the light on.  
 Have 512 addresses (addresses 1 to 512).  
 Dipswitches 1 - 9 set the address with 9 being the low bit.  
 Dipswitch 10 controls blink / no blink. Closed = no blink.

Model RCL01SN/A and RCL02SN/A  
 The PLC on command does turn the light on.  
 Have 512 addresses (addresses 1 to 512).  
 Dipswitches 1 - 9 set the address with 9 being the low bit.  
 Dipswitch 10 controls blink / no blink. Closed = no blink.

Model RCL01T/A and RCL02T/A  
 Can be used as a three-way switch.  
 Have 256 addresses (addresses 1 to 256).  
 Dipswitch 1 is unused.  
 Dipswitches 2 - 9 set the address with 9 being the low bit.  
 Dipswitch 10 controls blink / no blink. Closed = no blink.

**WIRING CONNECTIONS**

RCL01S/A, RCL02S/A, RCL01SN/A & RCL02SN/A  
 Black wire = energized line.  
 Blue wire = switched energized line.  
 Red wire = neutral or another energized line.  
 Green wire = equipment ground.

RCL01T/A & RCL02T/A  
 Black wire = energized line.  
 2 Blue wires = to standard 3-way switch.  
 Red wire = neutral or another energized line.  
 Green wire = equipment ground.

**SPECIFICATIONS**

Relay in RCL01S, RCL02S, RCL01SN, RCL02SN = SPST NO rated 20A resistive @ 277 Vac, 20A ballast @ 277Vac, 6 A ballast @ 480 Vac, 1HP @ 120Vac, 2HP @ 277Vac, 10A Tungsten @ 120Vac, 770 VA pilot duty @ 120 Vac, 1109 VA pilot duty @ 277 Vac.  
 Relay in RCL01T, RCL02T = rated 20A resistive @ 277 Vac, 10A ballast @ 277Vac, 3 A ballast @ 480 Vac, 1HP @ 120Vac, 2HP @ 277Vac, 2A Tungsten @ 120Vac, 770 VA pilot duty @ 120 Vac, 1109 VA pilot duty @ 277 Vac.  
 Power input for RCL01 = 50ma @ 120Vac, for RCL02 = 75ma @ 277Vac.  
 Minimum sensitivity = 10 mV peak-to-peak PLC.  
 Has absolute rejection of all signals outside of +/- 0.8% of channel center.  
 PIC communication has confirmation means, redundancy and continuous refresh.  
 Operating temperature range = -30 to 140 degree F. Storage temperature range = -40 to 185 degree F.  
 Humidity range = 5 to 95% (noncondensing).  
 Contains externally visible LED which indicates status of light. LED on means light is off, LED off means light is on.  
 Housing = 1.75" wide X 2.75" high X 1.45" deep plus mounting flange. Mounts in normal 2.5" deep wall switch box.  
 Contains 6" pigtailed for connecting to energized line, load (or other 3-way switch), neutral (or other energized line) and earth ground.