Universal Remote Controlled Lamp Dimmer
User's Manual

By: William J. Boucher, Document created Aug.7 '99, Revised Aug. 23 '00

Description:

The *Universal Remote Controlled Lamp Dimmer* is a compact electronic device used to control the brightness of any standard 110VAC incandescent lamp (up to 300W). The lamp brightness can be adjusted using push buttons on the unit or by sending it infrared signals from most standard *universal* remote control transmitters. The advantage of this controller over other lamp controllers is its ability to easily learn and remember the codes sent to it from almost any button on a *universal* transmitter. Since this controller adapts to transmitters that you likely already use to control a TV, VCR, cable converter, or other equipment, it doesn't need to be sold with its own unique transmitter. You can *program* the lamp controller to respond to almost any button that you desire to control the lamp. In most cases, users do not make full use of their universal remotes and as a result there is often at least one *mode* that is not in use. That unused mode can be programmed to operate the lamp controller without interfering with other devices. Since the lamp controller can be programmed to respond to almost any button on the transmitter, several lamp controllers in the same room can be programmed for different buttons such that they respond individually. Programming the lamp controller is a very quick & simple process.

The lamp controller is comprised of a compact, transformerless circuit, built on a printed circuit board that contains several modern electronic components. The main components on the circuit board are a microcomputer chip, the infrared signal detector, power management components, and the lamp driver. The microcomputer chip is the component that performs all of the intelligent functions of the lamp controller including learning and storing function codes as well as controlling the lamp.

The lamp controller case:

Inside the lamp controller:
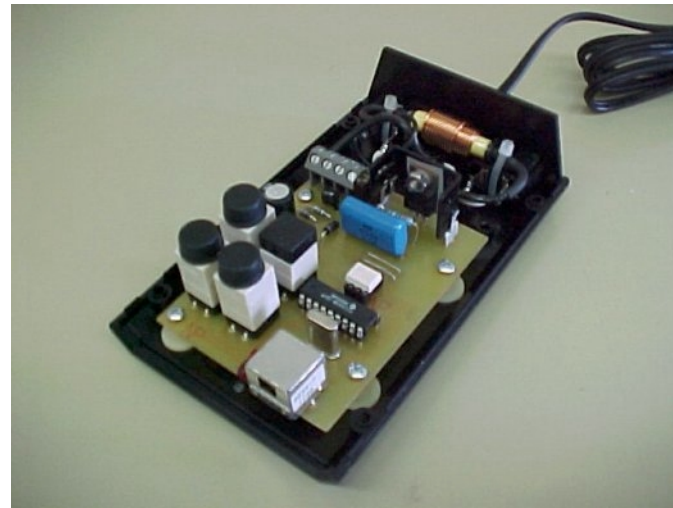
Setting up the lamp controller:

The lamp controller is very easy to set up and use. Simply plug it into any standard 110VAC polarized power outlet. A red light will flash for 2.5 seconds after it is plugged in to indicate all is well. Then plug your lamp into one of the two polarized outlets in the rear of the control unit. You may plug one or two lamps into the controller so long as their combined power does not exceed 300W. Make sure that the lamp's switches remain in the *on* position. Note that if you plug in two lamps, they will be controlled in unison, not individually.

Program the lamp controller to respond to your universal remote control transmitter as described in the next two sections. Then you can control your lamp by pressing the buttons on the lamp controller or by using your remote control transmitter.

When the lamp controller is not receiving a signal and no button is pressed, the red light glows very dimly but steadily. This indicates that the lamp controller is receiving power and it also serves as a *night-light* function.

Whenever the lamp controller sees an infrared signal, the red light in the sensor window blinks. This will let you know that a signal is being detected. When the controller locks onto a signal that operates one of its functions, the red light will illuminate steadily & brightly. Pressing a control button also causes the red light to illuminate brightly.

Preparing your remote control transmitter for use with the lamp controller:

Note: The lamp controller is specifically designed to decode RCA codes. Some other brands use very similar encoding techniques and you may find some that work adequately.

Usually, you will have a button on your universal remote control transmitter for a device that is not in use. Perhaps there's a button for a cable converter, VCR or VCR2, DSS, Satellite, or AUX device that you do not use. If there is, you can use it to control your lamp. Simply refer to the owner's manual for your transmitter and program the previously unused mode for any RCA device that you do not already have in use. Once your transmitter has a specific mode programmed for an RCA device (that will not interfere with your other existing equipment), you are ready to program the lamp controller.

Choose three buttons on your remote transmitter that you'd like to use to control the *Dim, Bright,* and *On/Off* functions of the lamp controller. Note that some buttons, such as the volume buttons, may still affect your TV even after you've entered another mode such as AUX, Cable, or VCR2. Some VCR controls such as *play* may also remain active in your new *lamp control* mode. Such buttons should not be chosen to control the lamp.

Programming the lamp controller:

The lamp controller will not erase the codes it has stored in its memory no matter how long it remains without power. This means you can unplug your lamp controller and you will not have to re-program it after you plug it back in. This also means that power outages will not effect the stored codes.

1.   Press the mode button on your transmitter that will be used to control the lamp.

2.   Using a thin instrument, such as a ballpoint pen, toothpick, or Q-tip, press (click) the Set button. Note that you must perform step 3 within 5 seconds of clicking the Set button or programming will not occur.

3.   Press & release the button on the lamp controller for the function that you are programming such as the *On/Off* button. Note that you must perform step 4 within 5 seconds of clicking the function button or programming will not occur.

4.   Hold your transmitter within 1 meter of the lamp controller, facing the sensor window, and press the button on the transmitter (that you wish to use for the function being programmed). The lamp controller will capture and store the code it receives and this code will operate the function just programmed from now on. If you continue to hold the transmitter button after the lamp controller has stored the code, the lamp controller will begin responding to that button immediately.

5.   Repeat steps 2 to 4 for the other two remaining functions. All three functions are individually programmable. It does not matter what order you program them in. If you reprogram one function to change the transmitter button that operates it, you do not need to reprogram the other functions. Be sure you don't program more than one lamp controller function to respond to the same transmitter code.

(On / Off) button

(Dim) button

(Set) button
- recessed

(Bright) button

Sensor window
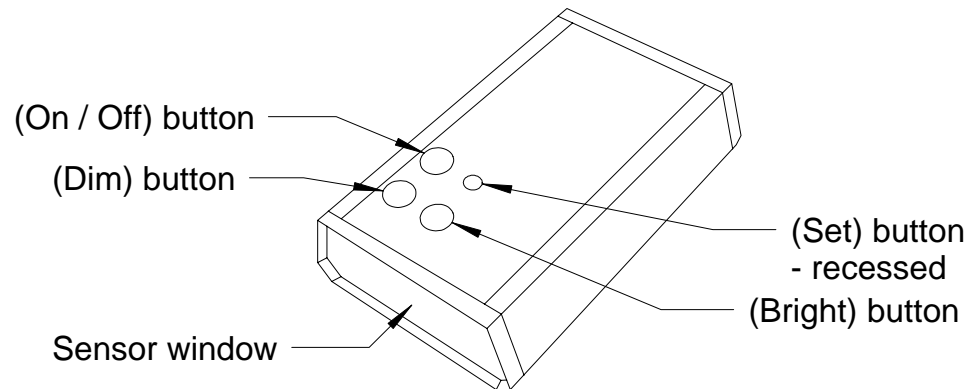
Warnings:

Disclaimer: Because the electronic device described herein operates directly on household line voltage, extreme caution is required to avoid personal injury, fire, etc. This information is provided for educational use only. The author assumes absolutely no responsibility for its content or application or any damages resulting directly or indirectly from its use or misuse.

Do not connect more than 300W of lamps to the lamp controller or it may overheat. For safety, the lamp controller is internally fused at 5A. If the fuse blows, the lamp controller will no longer function. A qualified service technician must replace the fuse.

Since the lamp controller operates directly from 110VAC-outlet power, it is dangerous for you to open its case unless you are a qualified service technician.

Do not attempt to repair or modify the lamp controller circuitry yourself. Doing so could cause injury or present a fire hazard.

Using the lamp controller with incandescent lamps is completely safe. Do not connect loads other than incandescent lamps to the lamp controller such as florescent lamps, TVs, fans, appliances, etc. Doing so could damage the lamp controller or the devices connected to it. In rare instances, it could even cause a fire.

Do not operate the lamp controller outdoors, or near water.

Do not use any type of solvent to clean the lamp controller case. Solvents will damage the plastic. Unplug the lamp controller and use a slightly dampened cloth to wipe it clean. Do not allow water to enter the holes around the buttons or near the outlets.

For more information regarding the *Universal Remote Controlled Lamp Dimmer* contact:

Name: William J. Boucher
Email: boucher@mnsi.net
Website: http://www.mnsi.net/~boucher/index.htm

Schematic — Infrared Remote Controlled Lamp Dimmer (IRCLD4.SCH)

POSSIBLY CHANGE XTAL TO RESONATOR

+5V

U3
RESET I/P
NC
NC
NC
NC
NC
GND
MC33064D

+5V   LOGIC POWER SUPPLY

D1 1N4007

HIGH POWER DRIVER

R7 POLYFUSE
PTC
J2-1 AC-L

C1 1000uF 10V
Z2 1N4735A 6.2V

C3: Mouser Stk# 146250V10k

+5V

R4 10k OPTL
R1 2.7k

U1 PIC16C84
4 MCLR   OSC1/CLKIN 16
6 RB0/INT   OSC2/CLKOUT 15
17 RA4/RTCC RA2
2 RA0   RB1
18 RA3   RB6
9 RA1   RB2
13 RB3   RB5
   RB7   RB4

XTAL1 10MHz

IR RECEIVER MODULE LT1060-ND

J1-1

+5V

J1-2
J1-3

C2 100nF

C3 1uF 250V
R2 330
R2: 1/2W min

ZERO CROSSING DETECTOR

R3 560

R5 10k   R9 1M

Z1 1N4733 5.1V

M1 MOVCG2

L1 RED
K   A
R6 220

SW1 STORE

SW2 ON/OFF

SW3 BRIGHTER

SW4 DIMMER

RESPONSE INDICATOR

U2 MOC3012
MOTOROLA

R8 180

TH1 MAC12D MOTOROLA

INCANDESCENT LAMP

J2-2

J2-3

J2-4 AC-N

COMPANY:

BILTRONIX

TITLE:
Infrared Remote
Controlled Lamp Dimmer

FILENAME: IRCLD4.SCH
SIZE: B
DRAWING NO: IRCLD4
REV: 1

DRAWN BY: WILLIAM BOUCHER
CREATED: JAN.12'98
LAST REVISED: JULY 18'99
SHEET: 1 OF 1