

## **E-FIELD SENSOR CONTEST – ENTRY #EFF328**

by Thomas Dowad September 30, 2003

Photo by Jack Rowand

### **ABSTRACT**

My project is a LED Lamp, with variable brightness controlled by a touch-sensitive fader.

Touching any position along the row of electrodes sets the LEDs to a proportional brightness. Touching by the leftmost electrode will set the lamp brightness to it's lowest value. This is not "off", as the lamp can be turned off with the power switch.

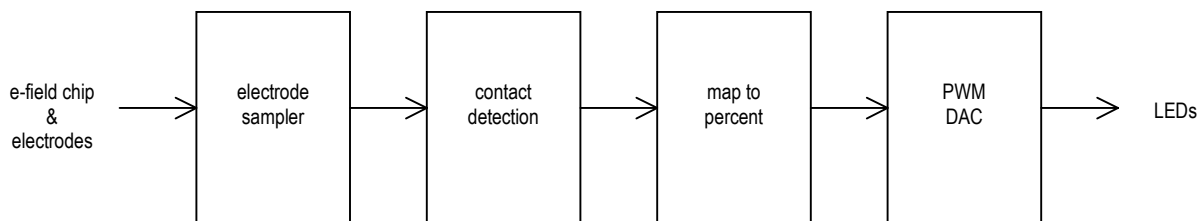
The prototype utilizes a shell from an inexpensive halogen desk lamp. The e-field board is housed in the base of the lamp. Sensing electrodes are arrayed across the top of the base. The head of the lamp houses a simple LED circuit. The e-field board connects to the LED circuit through wires that run up the neck of the lamp. Power is supplied by an external "wall wart" power module.



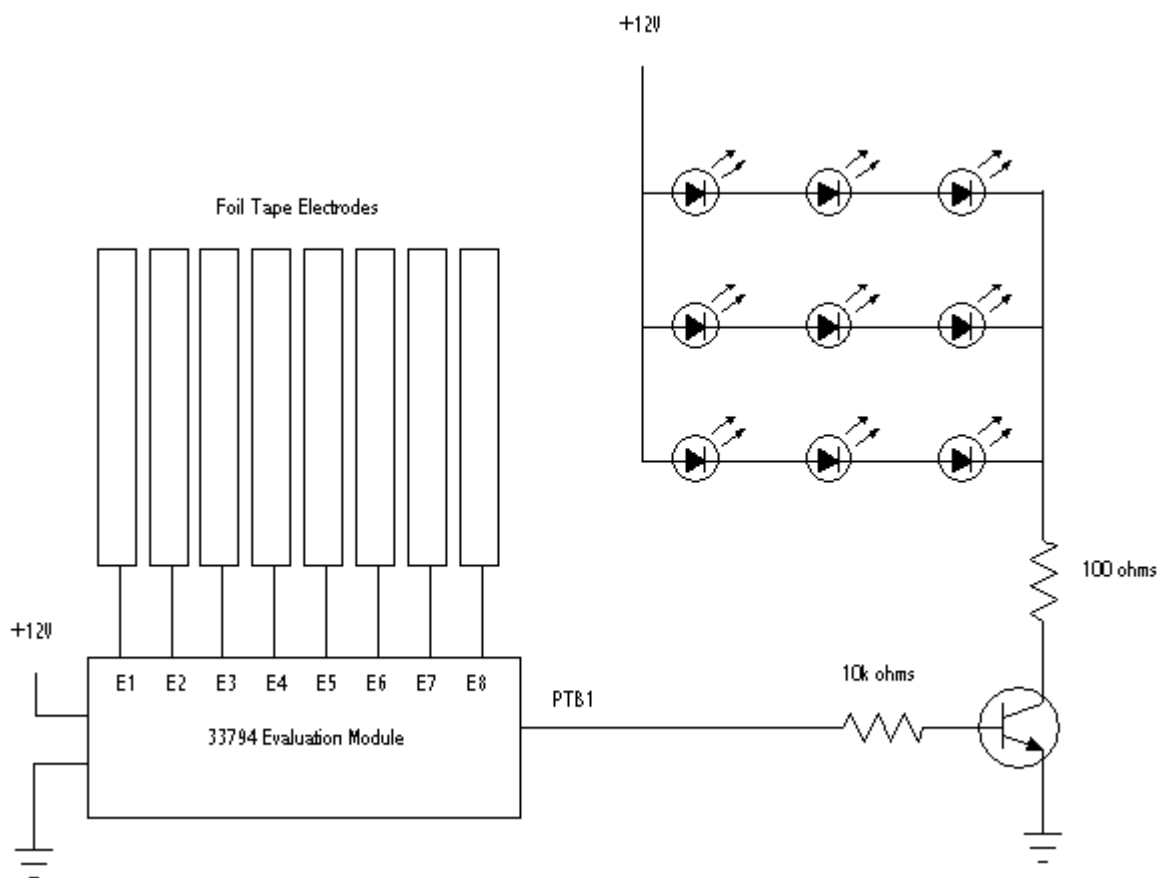
The electrodes are arranged such that a finger in contact with the surface of the base will be sensed by either one or two of the electrodes at one time. The electrode width is comparable to the size of a finger, and electrodes are closely spaced, so that single electrode and dual electrode contact positions are more-or-less equally spaced.

Various enhancements could be made to this intelligent lamp. For instance, the serial port on the MC33794 EVM could be used to allow user settings to be made. With a time reference (such as a 60 Hz power-line-derived pulse), a clock could be implemented, with programmed on and off times and brightnesses.

### BLOCK DIAGRAM



### SCHEMATIC



## CODE SAMPLE

```
;
; Sample code, for converting electrode samples into a
; fader position. The fader is referred to as an "e-slider".
; Note a lookup table of 256 values is required but not shown here.
;
; copyright © 2003 Thomas Dowad. All Rights Reserved
;

;*****
;* ESLIDER: CONSTANTS
;*****

ESLIDER_THRESHOLD    EQU    160
ESLIDER_IGNORE       EQU    255

;*****
;* ESLIDER: VARIABLES
;*****

DEFAULT_RAM          SECTION SHORT

esl_value             RMB    1
esl_status            RMB    1

;*****
;* ESLIDER: CODE
;*****

DEFAULT_ROM          SECTION

;* NAME:              eslider_service
;* DESCRIPTION:       Periodic servicing of fader

eslider_service:
    clr                esl_status
    clrx
_esl_sample:
    jsr                efield_get_value
    cmp                #ESLIDER_THRESHOLD
    ror                esl_status
    incx
    cpx                #8
    bne                _esl_sample
    ldx                esl_status
    lda                eslider_map,X
    cmp                #ESLIDER_IGNORE
    beq                _esl_exit
    cmp                esl_value
    beq                _esl_exit
    sta                esl_value
    jsr                dac_set
_esl_exit:
    rts
```