This small but handy circuit is ideal for replacing an existing dimmer or switch, in order to be able to control a lamp, set of lamps or even a motor via an adjustable DC voltage. One obvious application is control via the K8000 interface board, thanks to its optically isolated input.

Specifications:
- Operating voltages: 24, 110-125 or 220-240VAC 50/60Hz
- Max. load: 3.5A (750W/220V; 380W/110V; 80W/24V)
- Control voltage: 0 to 10VDC
- Max. control current: 2.25mA at 12VDC
- Control voltage and load are optically isolated
- Isolated triac
- Dimensions: 48x74mm (1.9”x2.9”)

Applications:
- Control power circuits with a safe DC voltage
- Ideal for computer interfacing projects (with K8000)
- Adjust lighting, speed of collector motors, …
- Your own unique application

DANGER!
Observe all safety requirements!
<table>
<thead>
<tr>
<th>CODE</th>
<th>CODICE COLORE</th>
<th>CODIGO DE CORES</th>
<th>CODIGO DE COLORES</th>
<th>VÄRIKOODI</th>
<th>FÄRGSCHEMA</th>
<th>FARG KODE</th>
<th>FARGE KODE</th>
<th>FARVE KODE</th>
<th>FARB KODE</th>
<th>COLOUR CODE</th>
<th>CODIFICATION DES COULEURS</th>
<th>KLEUR CODE</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Nero</td>
<td>Preto</td>
<td>Negro</td>
<td>Musta</td>
<td>Svart</td>
<td>Sort</td>
<td>Sort</td>
<td>Schwarz</td>
<td>Black</td>
<td>Noir</td>
<td>Zwart</td>
<td>0</td>
</tr>
<tr>
<td>1</td>
<td>Marrone</td>
<td>Castanho</td>
<td>Marrón</td>
<td>Ruskea</td>
<td>Brun</td>
<td>Brun</td>
<td>Brun</td>
<td>Braun</td>
<td>Brown</td>
<td>Brun</td>
<td>Bruin</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>Rosso</td>
<td>Encarnado</td>
<td>Rojo</td>
<td>Punainen</td>
<td>Röd</td>
<td>Röd</td>
<td>Röd</td>
<td>Rot</td>
<td>Red</td>
<td>Rouge</td>
<td>Rood</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>Aranciato</td>
<td>Laranja</td>
<td>Naranjado</td>
<td>Oranssi</td>
<td>Orange</td>
<td>Orange</td>
<td>Orange</td>
<td>Orange</td>
<td>Orange</td>
<td>Oranje</td>
<td>Oranje</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>Giallo</td>
<td>Amarello</td>
<td>Amarillo</td>
<td>Keltainen</td>
<td>Gul</td>
<td>Gul</td>
<td>Gul</td>
<td>Gelb</td>
<td>Yellow</td>
<td>Jaune</td>
<td>Geel</td>
<td>4</td>
</tr>
<tr>
<td>5</td>
<td>Verde</td>
<td>Verde</td>
<td>Verde</td>
<td>Vihreä</td>
<td>Grön</td>
<td>Grön</td>
<td>Grønn</td>
<td>Grün</td>
<td>Green</td>
<td>Vert</td>
<td>Groen</td>
<td>5</td>
</tr>
<tr>
<td>6</td>
<td>Blu</td>
<td>Azul</td>
<td>Sininen</td>
<td>Blå</td>
<td>Blå</td>
<td>Blå</td>
<td>Blau</td>
<td>Blue</td>
<td>Blue</td>
<td>Blauw</td>
<td>Blauw</td>
<td>6</td>
</tr>
<tr>
<td>7</td>
<td>Viola</td>
<td>Violeta</td>
<td>Morado</td>
<td>Purppura</td>
<td>Lila</td>
<td>Violet</td>
<td>Violet</td>
<td>Violet</td>
<td>Purple</td>
<td>Violet</td>
<td>Paars</td>
<td>7</td>
</tr>
<tr>
<td>8</td>
<td>Grigio</td>
<td>Cinzento</td>
<td>Gris</td>
<td>Harmaa</td>
<td>Grå</td>
<td>Grå</td>
<td>Grå</td>
<td>Grau</td>
<td>Grey</td>
<td>Gris</td>
<td>Grijs</td>
<td>8</td>
</tr>
<tr>
<td>9</td>
<td>Bianco</td>
<td>Branco</td>
<td>Blanco</td>
<td>Valkoinen</td>
<td>Vit</td>
<td>Hvid</td>
<td>Hvidt</td>
<td>Weiss</td>
<td>White</td>
<td>Blanc</td>
<td>Wit</td>
<td>9</td>
</tr>
<tr>
<td>A</td>
<td>Argento</td>
<td>Prateado</td>
<td>Plata</td>
<td>Hopea</td>
<td>Silver</td>
<td>Sølv</td>
<td>Sølv</td>
<td>Silber</td>
<td>Silver</td>
<td>Argent</td>
<td>Zilver</td>
<td>A</td>
</tr>
<tr>
<td>B</td>
<td>Oro</td>
<td>Dourado</td>
<td>Oro</td>
<td>Kulta</td>
<td>Guld</td>
<td>Guld</td>
<td>Guld</td>
<td>Gold</td>
<td>Gold</td>
<td>Or</td>
<td>Goud</td>
<td>B</td>
</tr>
</tbody>
</table>
1. **Assembly** (Skipping this can lead to troubles!)
Ok, so we have your attention. These hints will help you to make this project successful. Read them carefully.

### 1.1 Make sure you have the right tools:

- A good quality soldering iron (25-40W) with a small tip.
- Wipe it often on a wet sponge or cloth, to keep it clean; then apply solder to the tip, to give it a wet look. This is called ‘thinning’ and will protect the tip, and enables you to make good connections. When solder rolls off the tip, it needs cleaning.
- Thin raisin-core solder. Do not use any flux or grease.
- A diagonal cutter to trim excess wires. To avoid injury when cutting excess leads, hold the lead so they cannot fly towards the eyes.
- Needle nose pliers, for bending leads, or to hold components in place.
- Small blade and philips screwdrivers. A basic range is fine.

For some projects, a basic multi-meter is required, or might be handy

1. **Assembly Hints:**

- Make sure the skill level matches your experience, to avoid disappointments.
- Follow the instructions carefully. Read and understand the entire step before you perform each operation.
- Perform the assembly in the correct order as stated in this manual.
- Position all parts on the PCB (Printed Circuit Board) as shown on the drawings.
- Values on the circuit diagram are subject to changes.
- Values in this assembly guide are correct*
- Use the check-boxes to mark your progress.
- Please read the included information on safety and customer service

*Typographical inaccuracies excluded. Always look for possible last minute manual updates, indicated as ‘NOTE’ on a separate leaflet.

1. **Soldering Hints:**

Mount the component against the PCB surface and carefully solder the leads

Make sure the solder joints are cone-shaped and shiny

Trim excess leads as close as possible to the solder joint
### 1. RESISTORS

- R1 : 4K7 (4 - 7 - 2 - B)
- R2 : 100K (1 - 0 - 4 - B)
- R3 : 100K (1 - 0 - 4 - B)
- R4 : 470K (4 - 7 - 4 - B)
- R5 : 1M (1 - 0 - 5 - B)

Choose operating voltage:

- For 24VAC:
  - R6 : 15K (1 - 5 - 3 - B)
  - R7 : 39K (3 - 9 - 3 - B)

- For 110-125VAC:
  - R6 : 100K (1 - 0 - 4 - B)
  - R7 : 220K (2 - 2 - 4 - B)

- For 220-240VAC:
  - R6 : 220K (2 - 2 - 4 - B)
  - R7 : 470K (4 - 7 - 4 - B)

### 2. DIODES

- D1 : 1N4148
- D2 : 1N4148
- D3 : 1N4007

(Watch the polarity!)

### 3. CAPACITORS

- C1 : 4n7 (472)
- C3 : 100nF/250VAC (104 - µ1)
- C4 : 100nF (104 - µ1)

### 4. ELECTROLYTIC CAPACITORS

(Watch the polarity!)

- C2 : 100µF

### 5. IC SOCKETS

- IC1 : 6P
- IC2 : 8P
6. TRIM POTENTIOMETERS
- RV1: 220K (250K)
- RV2: 2M (2M5)

7. SCREW TERMINALS
- J1: 2P
- J2: 2 x 2P

8. POWER RESISTOR
- 24VAC:
  - R8: 1K5 (1 - 5 - 2 - B)
- 110-240VAC:
  - R8: 15K

9. MOUNTING OF THE TRIAC
- TR1: TRIAC

10. COIL
- L1: 50µH/6A

11. IC’s (Watch the position of the notch)
- IC1: 4N27 or eq.
- IC2: TEA1007 or eq.
12. CONNECTION EXAMPLE FOR RESISTIVE LOAD (FIG 1.0)

CONNECTION EXAMPLE FOR INDUCTIVE LOAD (FIG 2.0)

CONNECTION EXAMPLE WITH K8000 COMPUTER INTERFACE (FIG 3.0)
13. SET UP

- Connect a digital voltmeter to the PCB in parallel with the load.
- Set both trimpots to the middle of the range of adjustment.
- Switch in the control voltage and the supply voltage.
- Set the control voltage to 0V.
- Adjust RV1 (Min) until the voltmeter reads 0V.
- Set the control voltage to maximum.
- Adjust RV2 (Max) until the voltmeter reads the maximum voltage.
- Repeat both adjustments once again.
- The circuit is now ready for use.

**NOTE:** In some cases it can be useful to set the minimum level such that there is a small pre-voltage present, such as for example with stage and theatre lighting.

14. PCB LAYOUT

![PCB Layout Image]

15. DIAGRAM

![Diagram Image]