



Assembly Instructions for FK908 (Soil Moisture Indicator)

What it does:

This circuit responds to the amount of moisture in an area of soil. The more moisture present in the soil, the more lights will illuminate.

What we are making:

The finished circuit will have two wires (which make the “Probe”) that will be placed into the desired test area of soil. The circuit board will also have four light emitting diodes (LED’s) which will indicate the amount of moisture present in the test area.

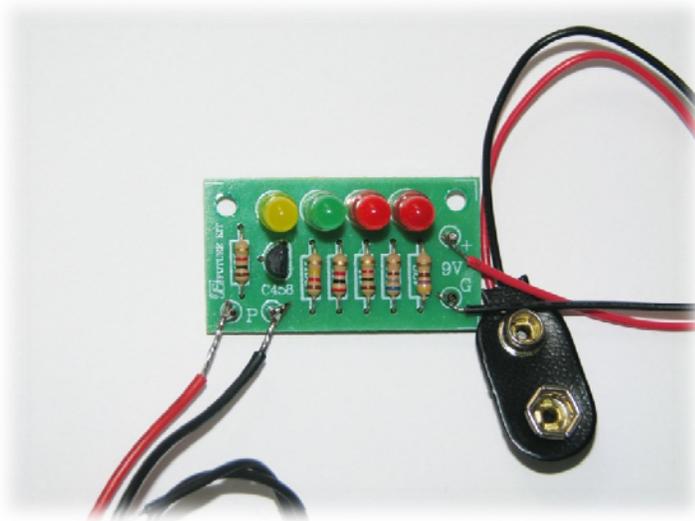


Fig 1: Finished Product

Technical Specs:

- Power supply: 9VDC
- Consumption: 20mA max.
- Amount of moisture: 4 levels
- PCB dimensions: 41 x 22mm



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How it works:

Current from the battery will flow through the first resistor (R1), the Probe (P) and then into the soil being tested. If there is moisture present the current will continue to flow through the circuit and light up the first LED. The higher the amount of moisture the more current will be able to flow through the soil, which will then turn the Transistor (TR1) on harder, resulting in more LED's illuminating.

Circuit Diagram:

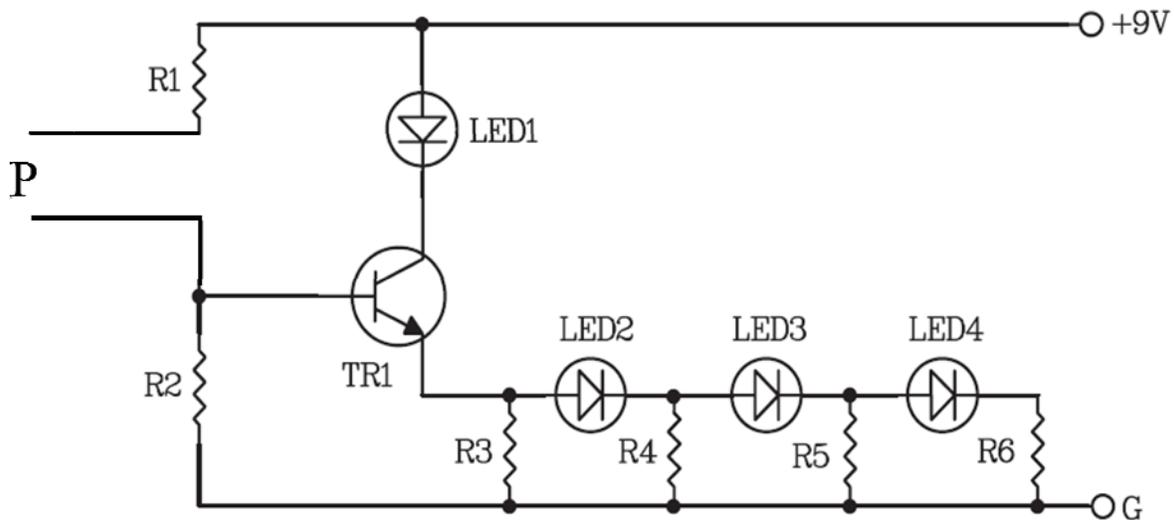


Fig 2: Circuit Diagram



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How to build it:

Step 1. Installing the resistors.

<u>RESISTORS</u>		
R1,R4	1k Ω	-brown-black-red-gold
R2	120k Ω	-brown-red-yellow-gold
R3	2k Ω	-red-black-red-gold
R5	680 Ω	-blue-gray-brown-gold
R6	470 Ω	-yellow-violet-brown-gold

Fig 3.1 Resistor Values

By referring to *Fig 3.1* determine the value of each resistor and place them in their correct positions as indicated on the printed circuit board (PCB). Do this by carefully bending their wires down to form a 'U' shape and poke through the holes in the PCB as shown in *Fig3.2*. Once they are in the correct positions solder them into place and trim the excess wire.

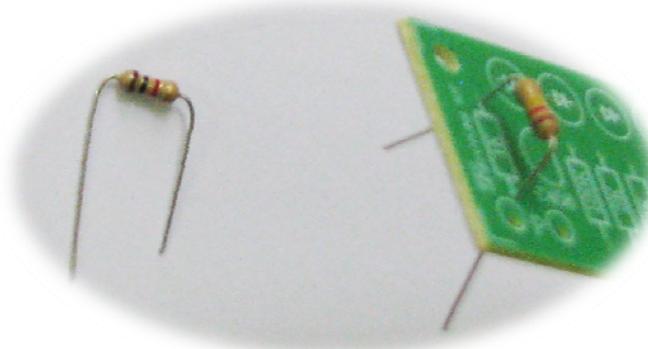


Fig 3.2 Installing Resistors



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Step 2. Installing the transistor.

Carefully bend the middle leg of the transistor slightly forward and the two outer legs out and carefully manipulate them as you place them through the holes and onto the PCB as shown in *Fig3.3*. Pull the legs through until the transistor is sitting about 10mm off the PCB. Once in the correct position solder it into place and trim the excess wire.

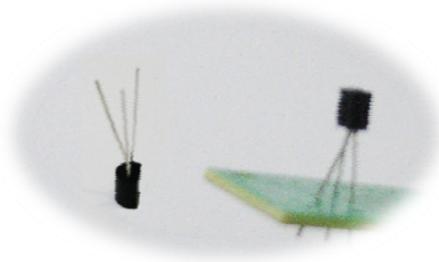


Fig 3.3 Installing the Transistor

Step 3. Installing the LED's.

Place the LED's on the PCB in the order of color shown in *Fig 3.4*. Take care with the polarity of the LED's, they must be installed facing the correct way. Ensure the longer leg of each LED is placed at the back of the triangle in the diode symbol which is shown on the PCB (see *Fig 3.4*). Once in the correct order, solder them in place and trim the excess wire.

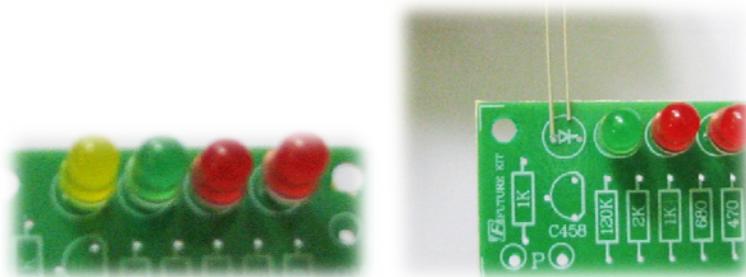


Fig 3.4 Installing the Coloured LEDs



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Step 4. Connecting wires and Battery snap.

One by one, place the four poles into their positions on the PCB and solder into place. Once they are set, 'tin' each pole with solder. (For more information on "tinning", please refer to our separate document "Towards Better Soldering"). The battery snap can be soldered into place by 'tinning' the leads and ensuring the black wire is attached to the 'ground' (G) or negative (-) pole and the red wire to the positive (+). Finally the two remaining wires can be tinned and then soldered to the two remaining poles. (See Fig 4 for attaching the wires).

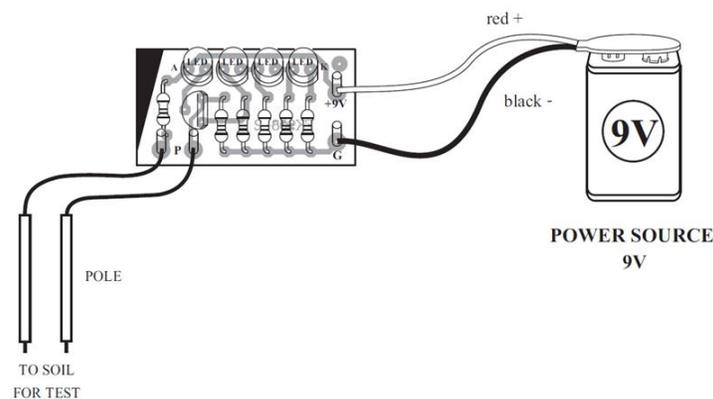


Fig 4 Attaching the wires

Testing:

Ensure the two test wires are separated and attach the battery to the battery snap. Place the two wires into a damp medium (examples may be: a cup of water, or damp soil, or a wet sponge).

As you move the wires further apart, less LED's should light up.