

HOW IT WORKS

As you can see in the circuit diagram Fig.4, the circuit has been divided into 3 sections, the oscillator, the probes and the output.

THE OSCILLATOR

The oscillator converts the direct current (DC) from the battery to a alternating current (AC) with a frequency of less than 1 cycle per second (CPS). The CPS abbreviation is also referred to as Hertz (Hz). We have designed the circuit so that we end up with low voltage AC on the probes. We have done this because DC current flowing through moisture will cause electrolysis.

This would electrochemically eat away the probes and possibly contaminate the soil in the pot. This contamination may also lead to false readings on the sensor. Using low voltage AC eliminates all of these potential problems.

THE PROBES

When the probes are left separated in air or if the soil is very dry the resistance will be so high that no current will flow between the probes. If the probes are touched together or the soil is wet the resistance will be low and will allow current to flow into the output section.

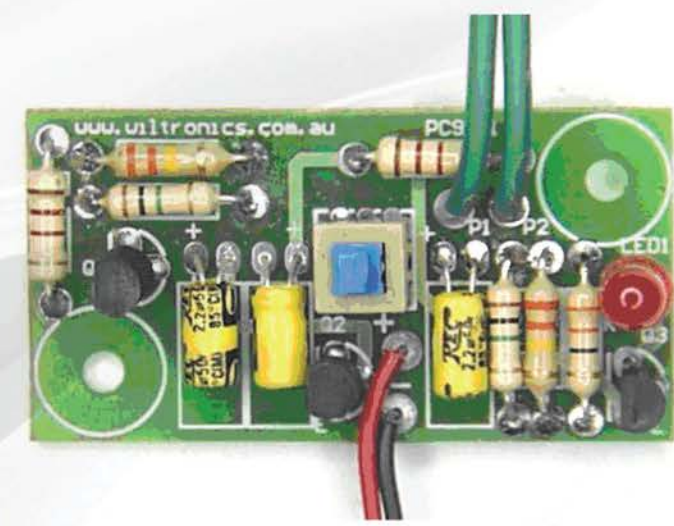
THE OUTPUT

In the output section, if there is no current flowing through the probes the transistor Q3 will turn on and the LED will light continuously. Indicating that the plant needs watering.

However if the resistance across the probes is low, a small AC voltage will flow through the probes to the base of the transistor Q3, turning the transistor off and on at the oscillator's AC frequency of less than 1CPS. The transistor's output will then turn the LED off and on. When the LED is flashing off and on the plant should not need watering

Moisture Sensor Kit

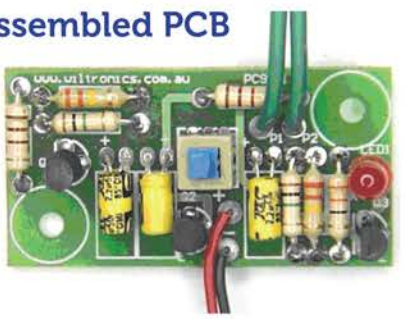
Tekky Kit



Component List

Designator	Part Description	Part No.
R1, R4	1K2 0.25W 1% Resistor (Brown, Red, Red)	RS1495
R2, R6	330K 0.25W Resistor (Orange, Orange, Yellow)	RS1785
R3, R5	1M0 0.25W Resistor (Brown, Black, Green)	RS1845
R7	33R 0.25W Resistor (Orange, Orange, Black,)	RS1305
C1, C2, C3	2.2uF 50V RB Capacitor	CC1405
LED1	Red LED 5mm	LED-5MM/R
Q1, Q2	NPN TO-92 Transistor	BC549
Q3	PNP TO-92 Transistor	BC559
SW1	Push ON-OFF Switch	SW1845
BH1	AAA x 2 Battery Holder	BA9145
BA	AAA Batteries 2Pk	BA2502
Probe		
PP1	2.36mm Connector Pin	CN5530
15cm	PVC Covered Cable	CB4001
2.0cm	3mm Heatshrink Tubing	HS1203

Assembled PCB



Assembled Probe with Heatshrink

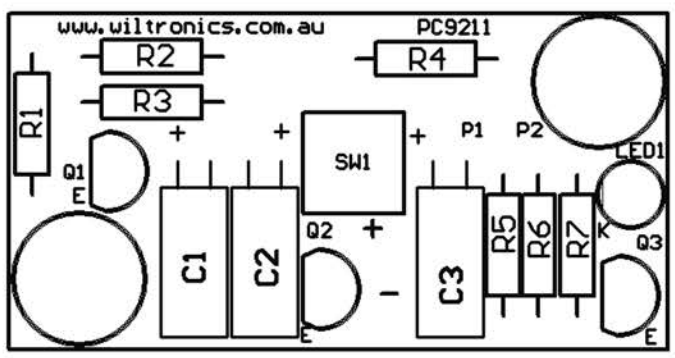


The Moisture Sensor is used to detect the presence of water in the soil. You should not over or under water your pot plants, either way can hurt your plants. The Moisture Sensor uses a simple Light Emitting Diode (LED) to indicate if your plant is thirsty or not. Push the probes into the soil and switch on the sensor, the LED will come on to show that the circuit is working. If the LED stays on continuously the soil is dry, and the plant needs to be watered, if the LED flashes on and off slowly then the soil is moist enough. Don't forget to switch the sensor off when not in use, to save your batteries from going flat

The Assembly

Check your kit of parts first, go through the component list, identify and check off each component. The parts should be inserted into the printed circuit board (psb) and soldered in. Fit the resistors first, then the capacitors

PCB Component Overlay



Note that, the capacitors are polarized, look for the positive sign on the pcb. The capacitors usually have the negative lead marked with a minus sign. Be careful with the transistors and LED these also need to be fitted the right way.

Next it is on to the probe leads, strip back approximately 5mm of the insulation from each wire, squeeze the flaps of the terminal pin onto the exposed wire with a crimp tool or some long nose pliers, then solder the joint. You will find some black tubing in the kit, this is heatshrink tubing.

Slide it over the pin so that it covers the end of the cable and the joint you have just made. Apply some heat to the tubing using a hot air gun (ie. an electric paint stripper) or even a match held close will cause the tubing to shrink down tightly onto the joint.

Do not touch the tubing or the wire with the flame. The probe leads can now be soldered into the pcb at P1 and P2. Finally add the battery holder red and black wire to the pcb. You will find 2 holes marked + & - just below the switch SW1.

The Sensor should be ready to test, fit the batteries and give it a try.