Demonstrator Setup Guide:

Follow this and hopefully things will run smoothly!

Equipment Check list:

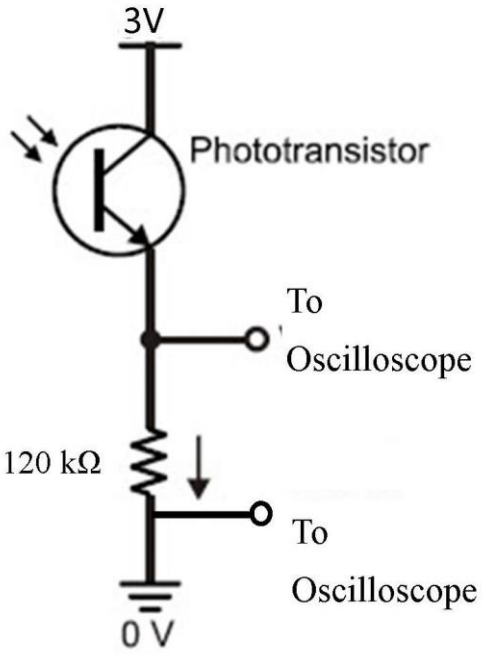
- 1 x Light pipe demo
- 1 x LCD practical
- 1 x digital oscilloscope
- 1 x signal generator
- 1 x battery pack
- 1 x power supply
- 5 x crocodile clips
- 1 x red banana plug leads
- 2 x black banana plug leads
- 2 x coax – banana plug leads
- 1 x coax – coax

Light pipe demo:

1. Check bulb is working.
2. Check tube is full of fructose solution
3. Rotate slit in the bottom until colours are clearly seen when viewed through polariser.

Setting up the connections:

1. The signal generator main outs should be connected to the LCD and Ch 1 on the oscilloscope
2. The power supply should be switched on **before connection** to the LED and the current limit set to a value less than 50mA (start with 25mA). Wire up the LED (the correct way round – it lights up!)
3. The detection circuit should be setup as shown. The 3V is supplied by a battery pack. Red to the 3V and Black to the ground. The voltage across the resistor should be connected to Ch 2 of the oscilloscope.
4. Arrange the wires coming from the detector such that they are unlikely to short on each other.



Setting the configuration

1. Signal generator – Check Attenuators are deselected. Push square wave and 3Hz button and set freq to 1Hz on knob. DC offset to 2.5v. Amplitude to 5V
2. Oscilloscope – Ch 1 set scale to 2V/division. Ch 2 set scale to 1V/division. Adjust the vertical position of each so they are clearly visible but separated on the screen. Set timescale to 250ms. Press Run/Stop and make sure the oscilloscope is producing a live image. Then press cursor and check that this is set up. Also adjust the trigger value to a suitable position (This only displays in single seq mode).
3. Check that with the signal generator off the signal being measured on Ch2 is bigger than 1V. If not:
    a. Increase LED brightness by increasing current (MAX 50mA)
    b. Remove the plastic tube and check that Phototransistor is somewhere near the top and pointing straight up. Wave the tube at the room lights and you should see a massive response. Try not to trap wires when putting it back.
    c. Play around with the position of the tube to maximise signal.

<u>Troubleshooting</u>

- Check nothing is shorting (ie crocodile clips or wires touching one another
- Check no attenuation etc on signal generators etc
- If you have insufficient signal
    - Adjust the positioning of LED
    - Increase current on LED powersupply (max 50mA)

    - Reposition Phototransistor within the tube. It can be very sensitive to position.
- Oscilloscope should be in DC coupling mode