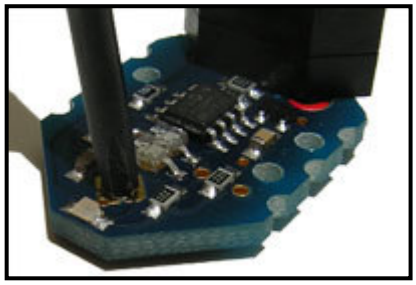
Line Tracker Expansion Pack

Explanation

The Line Tracker Expansion Pack allows your Viper to follow a black line (at least 20mm wide) on a white surface or a white line on a black surface.

With just a touch of your Microbric screwdriver you can calibrate the line tracking module to suit both the lighting conditions and the contrast of your line.

Calibrating the Line Tracking Module



Step 1> Using your Microbric screwdriver press the tip into the hole at the front of the module until the front LED flashes. (See image)

Step 2> When the front LED stays on place the module over the line you want your Viper to follow.

Step 3> When the front LED goes off place the module next to the line.

Step 4> The LED should then quickly flash 5 times to indicate successful calibration.

If the LED flashes slowly 5 times then the calibration has failed. This may be due to the surfaces being to similar in shade or the module being mounted too far away from the surface.

The output condition of the module is matched by the indicator LED at the front.

Output High – LED On
Output Low – LED Off

How it Works

The Line Tracker module shines a red light from a LED onto the surface that your Viper is driving on this light is then reflected back. The amount of light reflected back will depend on the colour of the surface, a white surface will reflect a lot of light, but black will reflect very little.

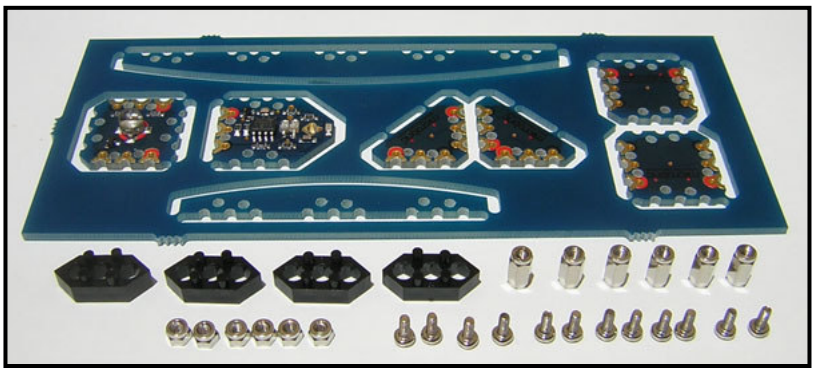
A phototransistor mounted next to the LED receives the reflected light and the onboard microcontroller then measures this and determines whether the surface is black or white. Once the microcontroller has determined this the output connector goes either high (5 volts) or low (0 volts).

The Line Tracker module also incorporates reverse polarity protection, so if the module is accidentally connected backwards there will be no damage.

As the light being used by the Line Tracking module is red your Viper is blind to red surfaces. This is because a red surface reflects just as much red light as a white surface does.

Another interesting thing the Line Tracker module can do is judge distances from a white or light coloured surface, as more light reflects back to the sensor when closer to a surface than further away. The operating range is only short at 3mm to 12mm, but is worth keeping in mind.

Pack Contents



Line Tracker Module	1
LED Module	1
Right Angle Module	2
Strips (3)	1
Strips (5)	1
Straight Modules	2
Plastic Brics	4
L3 Microbric Nuts	6
Microbric Screws	12
L8 Microbric Spacers	6

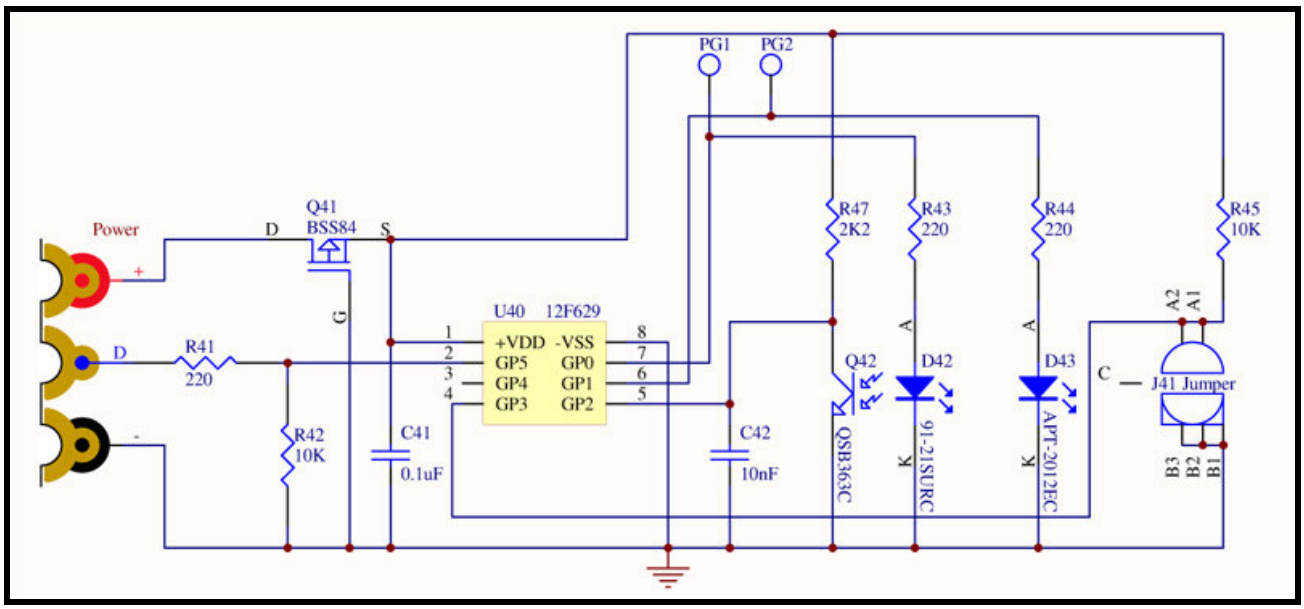
Example Code

```
;===SIMPLE LINE FOLLOWING ROBOT===

LeftMotor       con             P1              ;Declare LeftMotor to Pin 1
RightMotor      con             P11             ;Declare RightMotor to Pin 11

;===MAIN PROGRAM===
Loop:
        if in6 = 1 then TurnRight               ;Check the Line Tracker Module
                                                ;If it is on the line then turn right
TurnLeft:                                       ;If it is off the line continue to turn left
        pulsout LeftMotor,6000                  ;Brake the left wheel
        Serout RightMotor,i2400,["A",150]       ;Drive the right wheel
        goto Loop                               ;Loop around again

TurnRight:
        pulsout RightMotor,6000                 ;Brake the right wheel
        Serout LeftMotor,i2400,["C",150]        ;Drive the left wheel
        goto Loop                               ;Loop around again

        end
```

The program above basically checks to see if the robot is on the line and if it is it tries to get off the line and then when it gets off the line it tries to get back on it and so on…

Whilst this struggle of never being satisfied goes on the robot is actually moving forward and following the line!

Circuit Diagram



Specifications (Line Tracking Module)

Operating Voltage	5 volts
Current Consumption	Min. 10mA, Max. 25mA
Operating Height:	3mm to 12mm (from reflective/non-reflective surface)