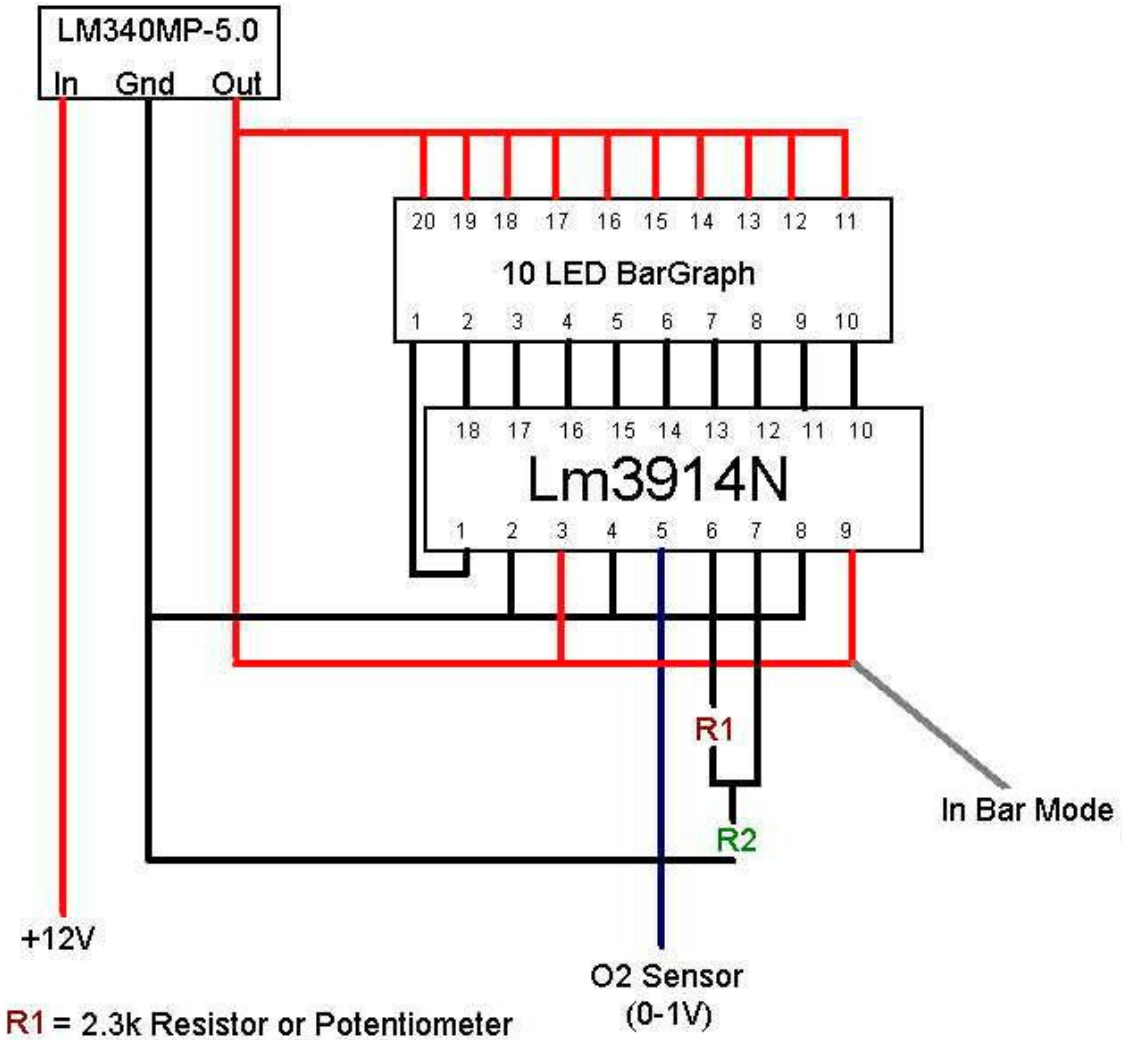

R1 = 2.3k Resistor or Potentiometer

R2 = 3.3k Resistor or Potentiometer

The Run Down

Chip sockets should probably be used as it is easier and there are fewer things that could go wrong. You don't have to though. but make sure when you use the sockets that you don't get the pins reversed when soldering. You can also un-solder the sockets out of old electronics or mother boards if you need some quickly. If you solder a bunch of wires from the chip to the LED socket you can have some placement flexibility for the LED display. Be aware that LED's only work one way. they have a Positive side and Negative side. There's a flat spot in the corner of the bargraph 'chip' to indicate Pin 1.

Most people want the wide band of the O2 measuring from 0-1v. But some might want a Finer Resolution. Where it'll measure from 0.4-1v. This would mean that the 1st LED will be ~0.4v and the 10th LED will be 1v. Engines equipped with a turbo, blowers, or Nitrous, might want a finer resolution as the Air / Fuel ratio is especially critical for those motors. In a Naturally Aspirated engine, the finer resolution might not be necessary as the proper mixture (14.7:1) is at about 0.5v from the O2 sensor.

Resistor R1 is what determines the resolution for the LED display. Resistor R2 is what determines the relative brightness of the LED. You can stick potentiometers in place of these resistors in order to fine tune the bar graph resolution and display brightness. If you decide to use the Potentiometer (POT) you need to get a Ohm meter and measure the range at which resistance ranges from 2.3k to 3.3k . As it is adjustable, you can change it later.

In order to run the display at the finest resolution possible, take out R1 and run it straight with no resistor in there. It should be that simple. During experimentation I had the resolution up to 0.7v as the 1st led, but i can't figure what i did to get that. I know it has something to do with the resistor as there are people out there that sell modified gauges that does this.. I will eventually figure it out. e-mail me about it if you'd like to discuss it further. Feel free to play around with it.

Currently it is setup as BAR mode. If you prefer DOT mode, disconnect pins 3 and 9. DOT mode is when one LED will light up at a time, while BAR mode all lights will light up, building to the final value.

Installation is as straight forward as you want it to be. Hook up the power to an accessory line, and connect up the ground to any clean metal. Connect up the Signal Wire to your O2 sensor. For testing purposes, I ran a wire out into my hood and just pushed it in the O2 sensor plug for now. Check your Bentley wiring diagrams to find the best place to connect to the O2 wiring harness. Note that the voltages from the O2 sensor are very low, so take extra care in taping the signal wire and make a high quality connection.

This is what I gathered for my Intellitronix gauge. The table represents what the lights signify. Please keep in mind that this is for the non modified gauges and in the measurements are in the wider resolution mode. This should be pretty close, but don't hold me to these values.

LED 10 - 0.97V - 12.1:1 - Very Rich - Forced induction and nitrous. you might want to be around here. (All LEDs on)
LED 9 - 0.88V - 12.7:1
LED 8 - 0.78V - 13.2:1
LED 7 - 0.69V - 13.8:1
LED 6 - 0.59V - 14.4:1
LED 5 - 0.49V - 14.9:1 - (Stoich- pretty close to 15:1, this is where NA motors should be at)
LED 4 - 0.39V - 15.4:1
LED 3 - 0.30V - 16.0:1
LED 2 - 0.20V - 16.5:1
LED 1 - 0.10V - 17.1:1 - Lean (The only LED on)

Parts List

DOT/Bar Display Driver: National Semiconductor LM3914N

Voltage Regulator: National Semiconductor LM340MP-5.0 or RadioShack #276-1770

10 Segment LED BarGraph - Radio Shack #276-081

Resistors (2.3k and 3.3k)

Optional Parts:
Mulit Colored LED (GGGGGGGRRR) - Radio Shack #900-6147

Mulit Colored LED (GGGYYYYRRR) - Newark Electronics Part #91F4665

18 Pin socket - Radio Shack #900-5741

20 Pin socket - Radio Shack #900-5742

2x 4.7k Ohm Potentiometer Radio Shack #271-281

Data Sheets
National Semiconductor LM3914N
National Semiconductor LM340MP-5.0