lecture 42

Signal conditioning Circuit for Operating Heater Voltage of MQ-7 Gas Sensor - Part 2

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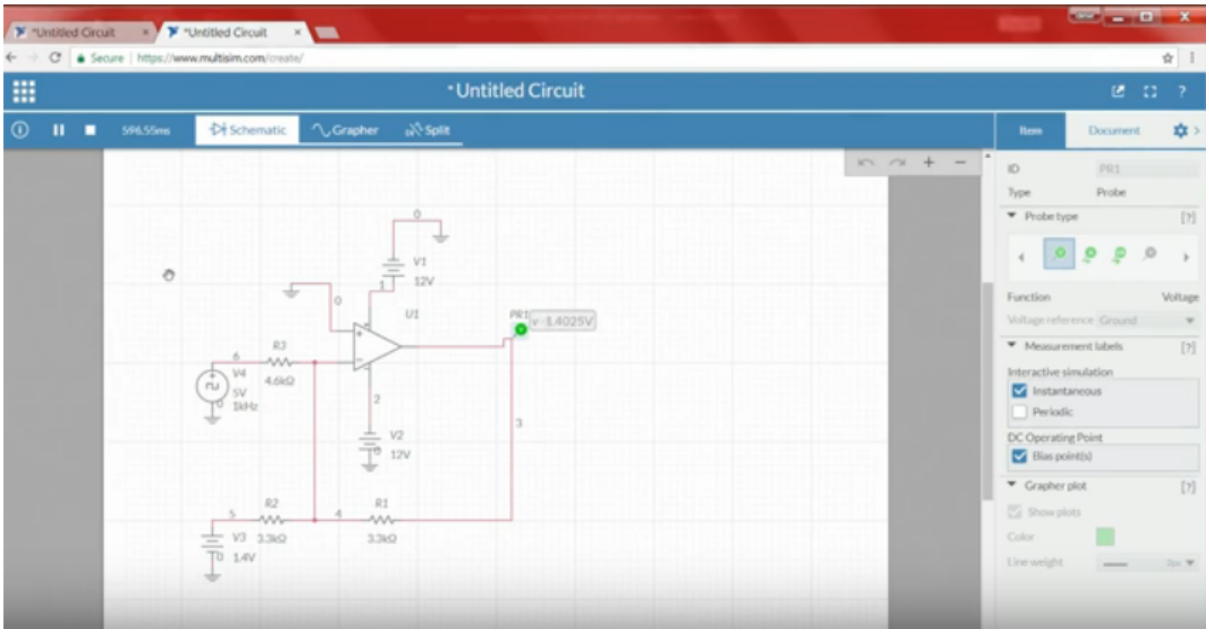

So now, let's simulate the signal conditioning circuit for the mq7 gas sensor. Initially, let me choose the five terminal, opamp and then, connect the voltage source, to the two terminal. So, this is one terminal, let's connect the supply voltage to the other terminal and then connect the ground. So, we have seen: that we have given the feedback registers, like we had designed the ratio of the resistors, let's connect them accordingly, so let's have my r1 resistor, in the feedback loop and then, we had the r2 resistor and we had given a constant 1.4 volt, DC source, to the resistor. So, this was the one point four volts, which was a, which was our requirement: that is when the function generator input goes to zero, ideally, I should have a one point four volt, constant voltage. Okay? Now that we have this part and then, we have, the other part, where we take the input from your, function generator and here, comes your input source, from your function generator. So, I choose the clock voltage source here and this goes as, input and then, connecting the ground to the source voltage. So here, I have a constant 5 volt, here and now, based on our discussion, let's give the values to each of the feedback resistors. So here, 3.3 K and then, this was 4.6 kilo ohm, hmm, so we need to monitor the output voltage, so here goes my probe, at the output end. Now, let's see, what happens when we run the circuit?

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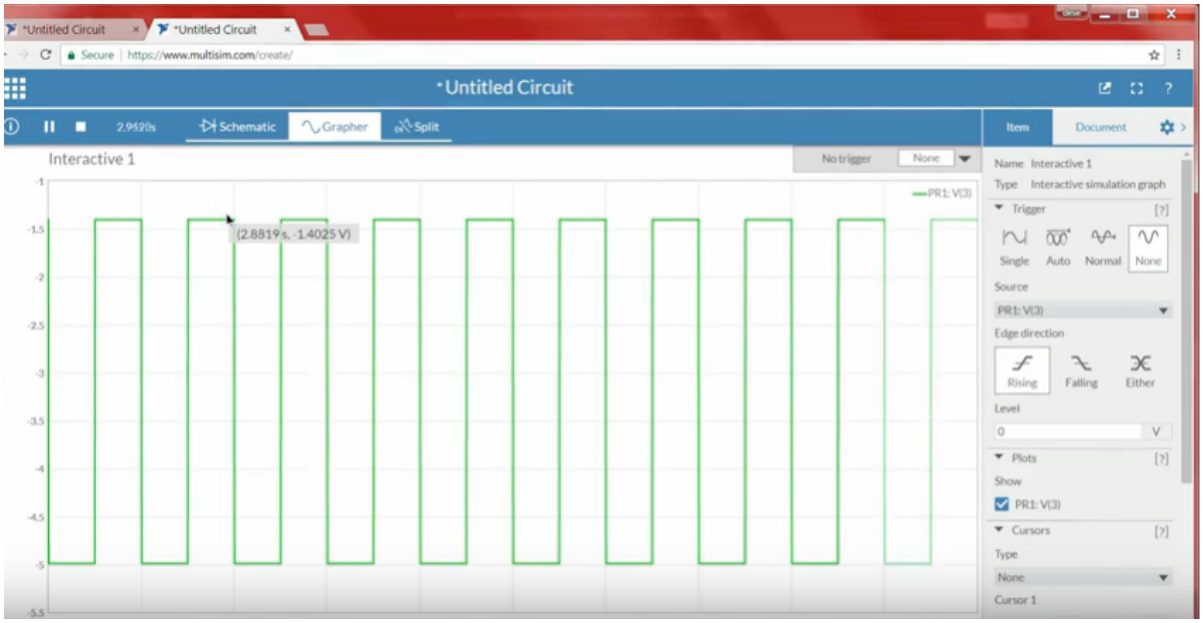

This is your negative, as you can see it is inverted, minus five and you are getting minus one point four. So, this is your inverted, output.

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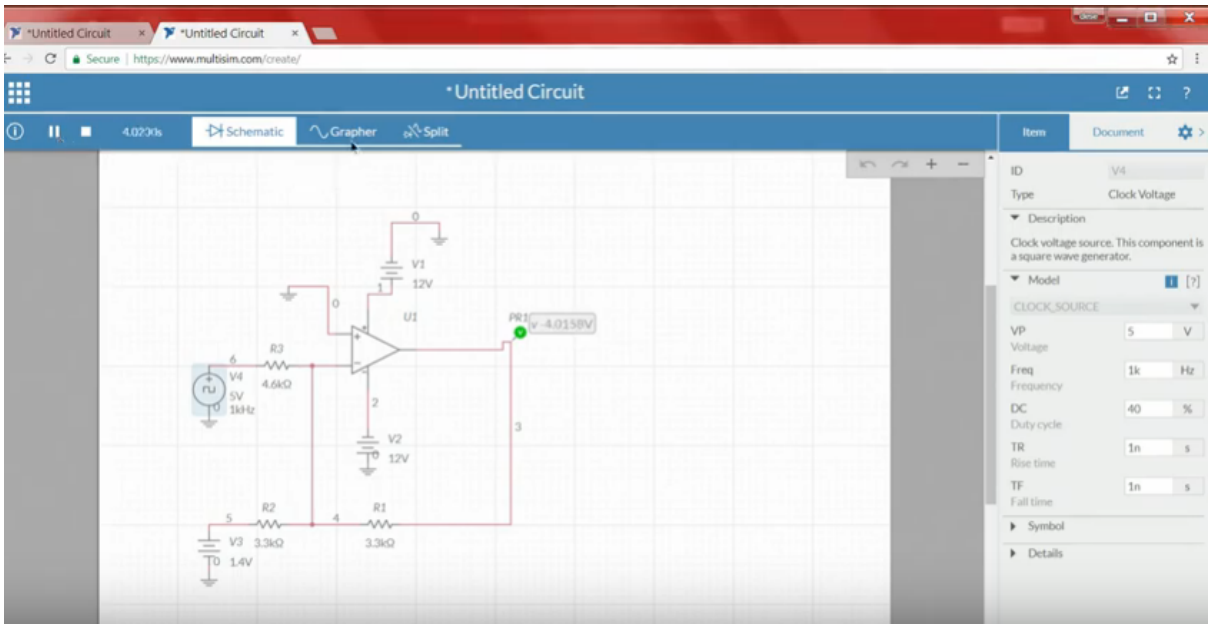

Going back to, my schematic here, you can see when your input is zero, the output remains at one point four volt: that is minus here, minus one point four volt. And then, here again I'll dearly, if you observe, what you can see here? From this is you can adjust the, the duty cycle. So, I'm adjusting this to 40% because, based on our gas sensor specification, which said 60%, 60 and 90, so based on that, you calculate your duty cycle the on and off period, is very specific to the type of sensor, what you're working and if you see here, it can only give you the higher voltage: that is the upper voltage, your source cannot flop give a, a different level in voltage that is either zero to five volts: that is why? You can see, why this, this kind of circuit becomes important, having a reference voltage, so that, you can manipulate, your output between two levels of voltage, rather than just going it, from zero to, the zero to five volts. So, here I've set the, duty cycle and we have given the input voltage.

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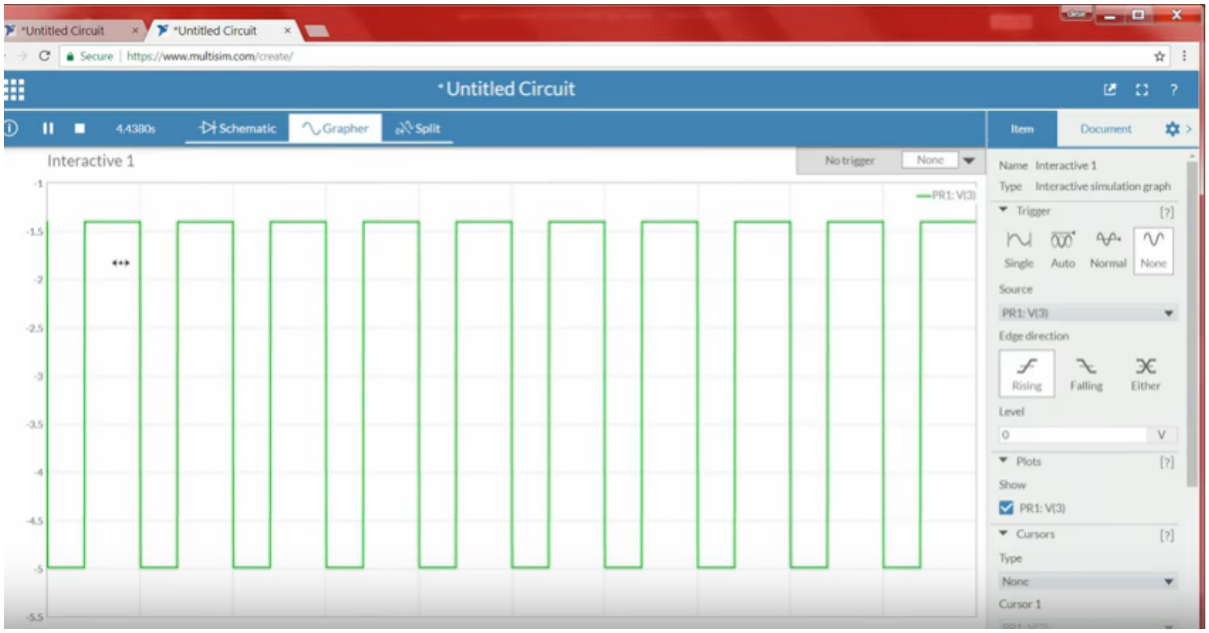

This is the on end of time.

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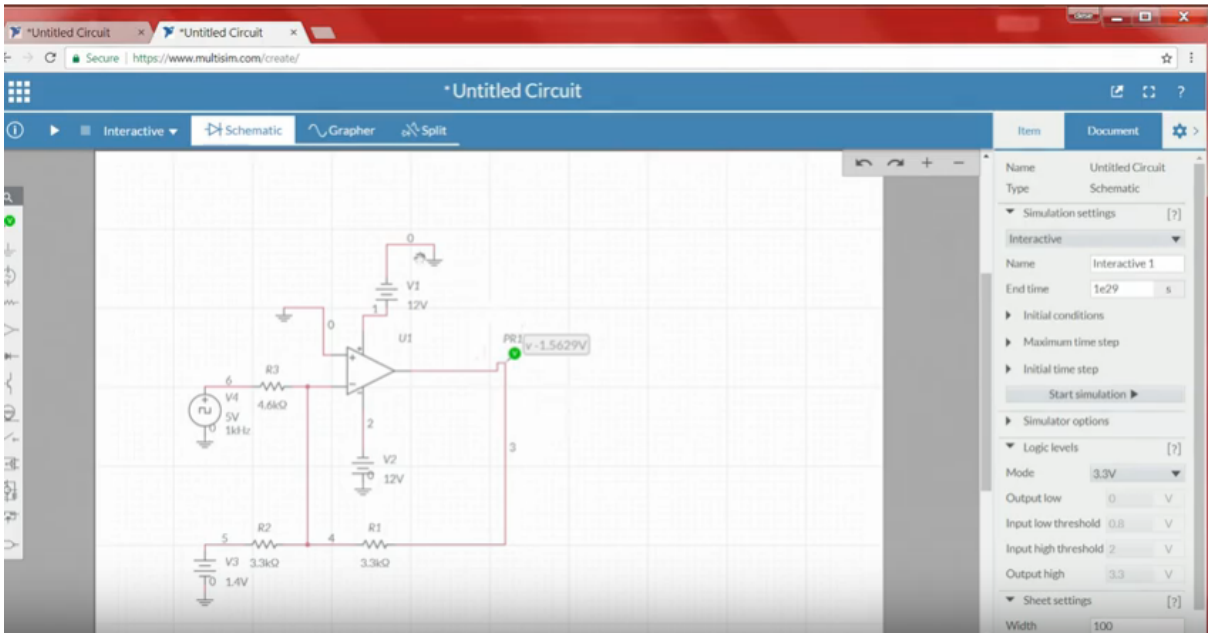

Now what do we do, in order to get, the positive voltage, like I'd mentioned, just give the feedback that is the output of this, will again be, feedback to the similar circuit and that is when, you will be able to get the desired, output voltage. Okay? Let's give the output, of this to the same circuit, now I leave that, to you, on the similar basis, connect the output voltage to the similar circuit, so you could work on, the circuit, what add mentioned? And you could also

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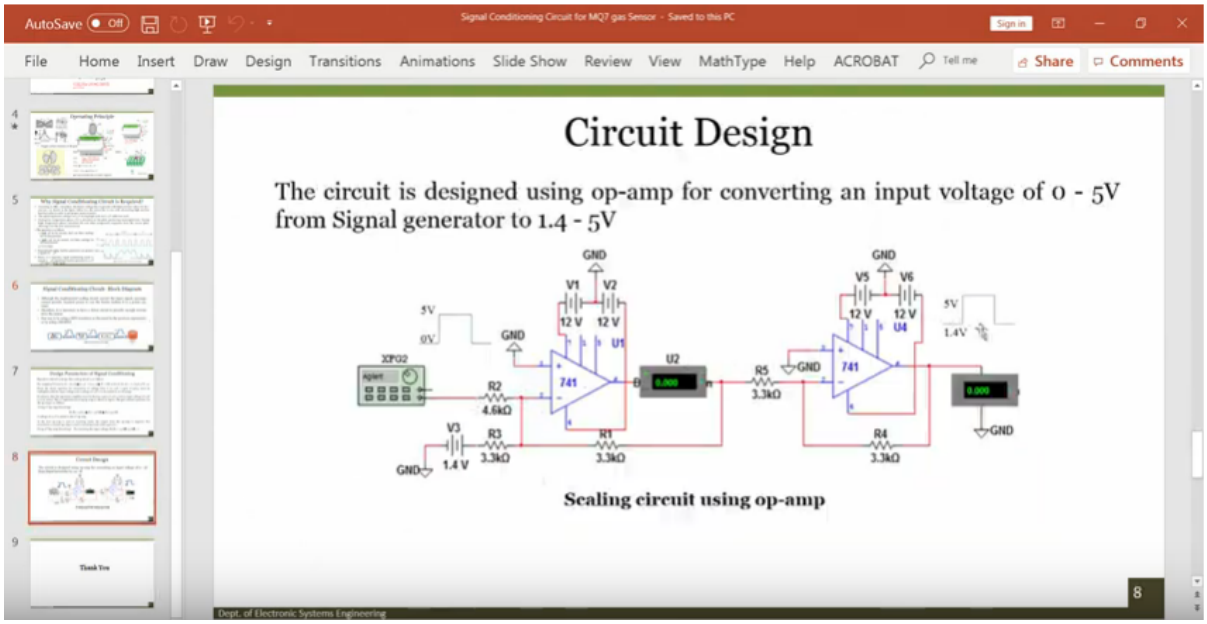

refer to the presentation here and then, see, observe if you are able to get the desired voltage level.

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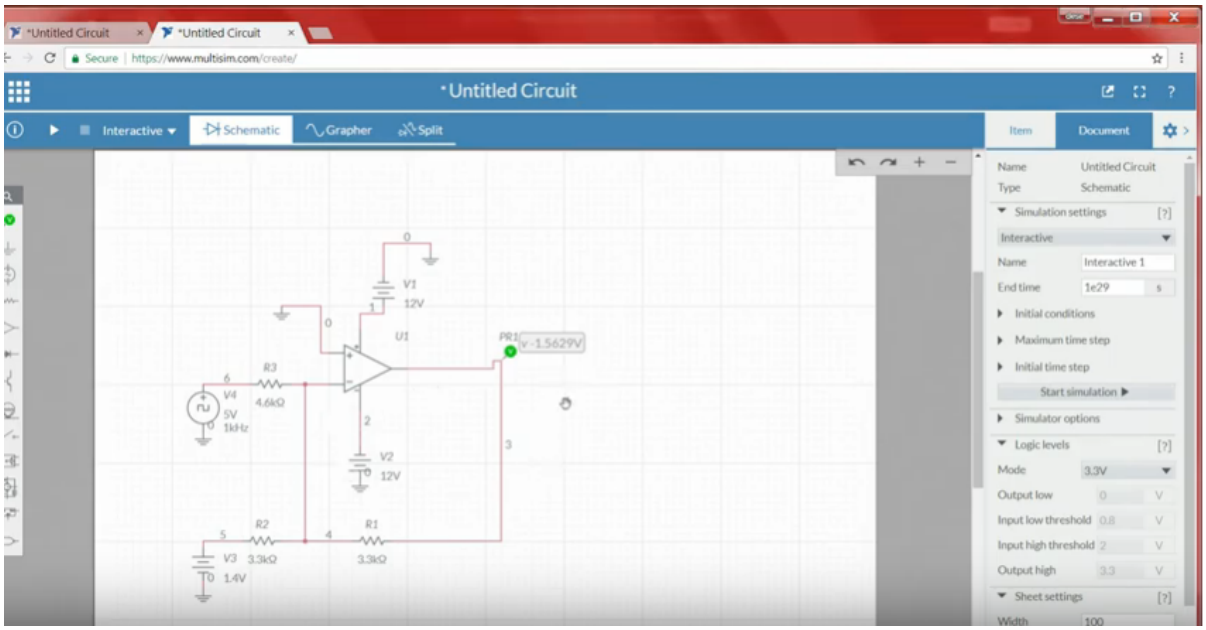

So, this was a basic simulation, about how you can choose, the different source the input source voltage, like your function generator, it plays the role of your function generator and how you can rig up the, circuit using the multi-sim, even before you, get into the hardware. Now, go ahead and give the output of this to the feed, the output of this to the similar circuit. So that, in your graph you observe

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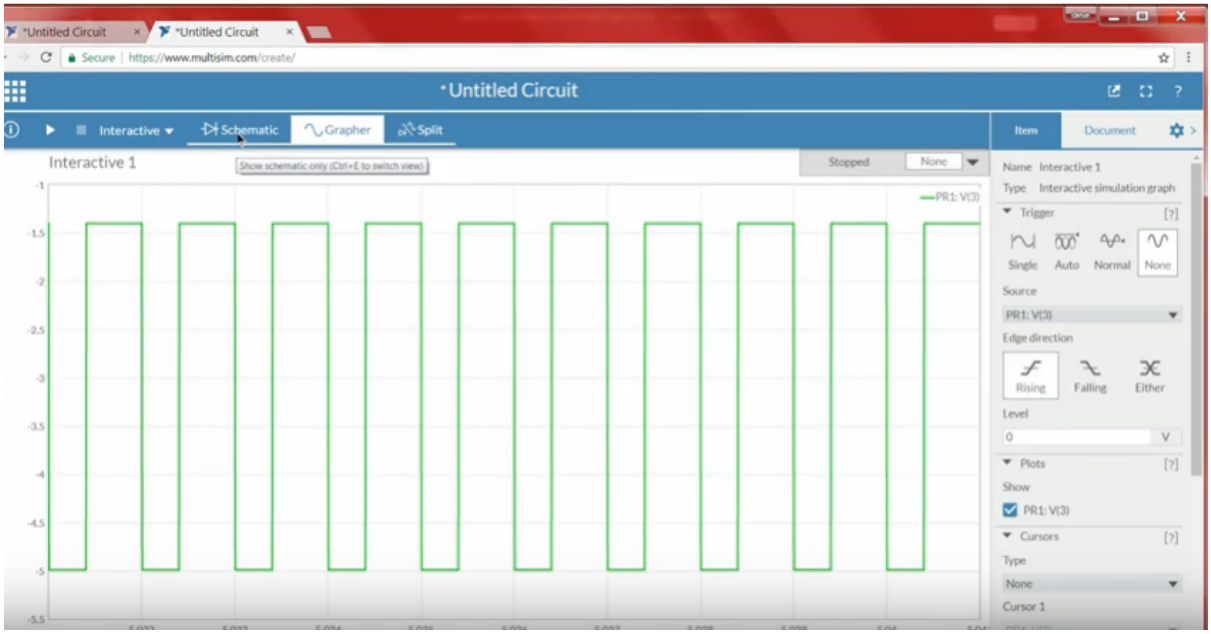

the desired voltage that is from positive 1.4 to 5 volts. So this is how, you can generate, signals or of desired, voltage level, based on the requirement of your sensor or depending on different applications,

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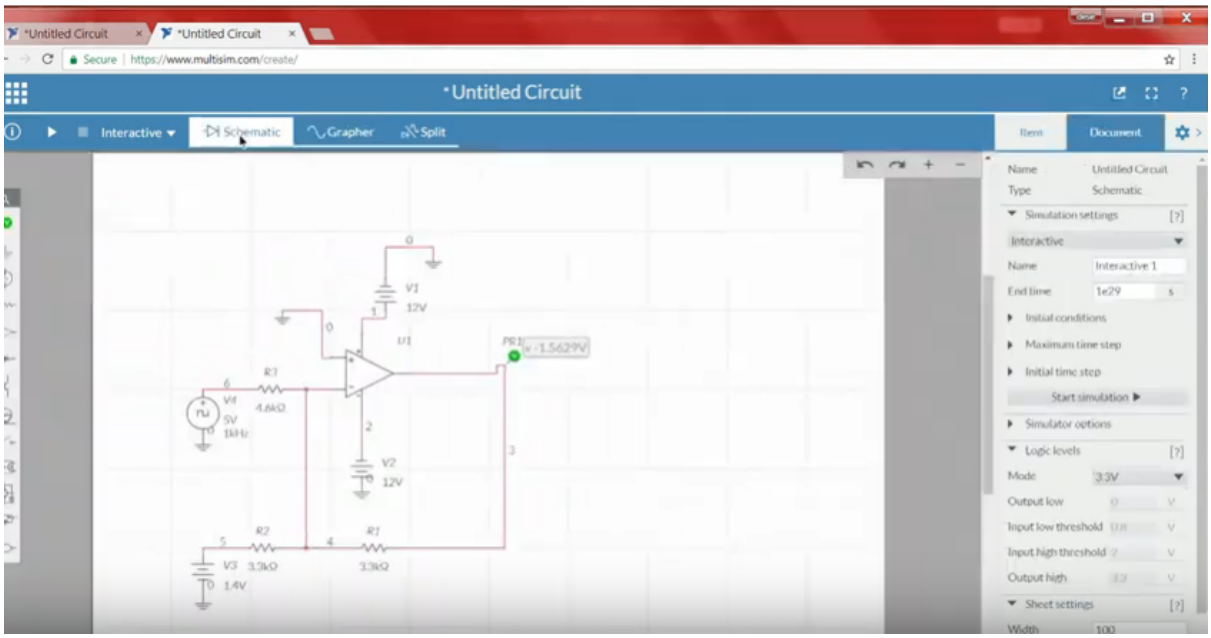

that this was about the simulation, for the signal conditioning circuit for an mq7 gas sensor.

Thank you.