

Meter Accuracy

DC Volts $\pm(0.1\% \text{ of the reading} + 1 \text{ digit})$

DC Amps $\pm(0.3\% \text{ of the reading} + 1 \text{ digit})$

Resistance $\pm(0.2\% \text{ of the reading} + 1 \text{ digit})$

What does this +1 digit mean ?

Range	Display
200mV	00.0
2V	0.000
20V	0.00
200V	00.0



Lets say, in a circuit, we are reading a 0.812 volts using the 2V range setting

The accuracy is $\pm(0.1\%$ of the reading + 1 digit)

So the accuracy is ± 0.000812 V But the meter can only display 3 digits beyond the decimal point (2V range)

Therefore actual reading accuracy is ± 0.001 V

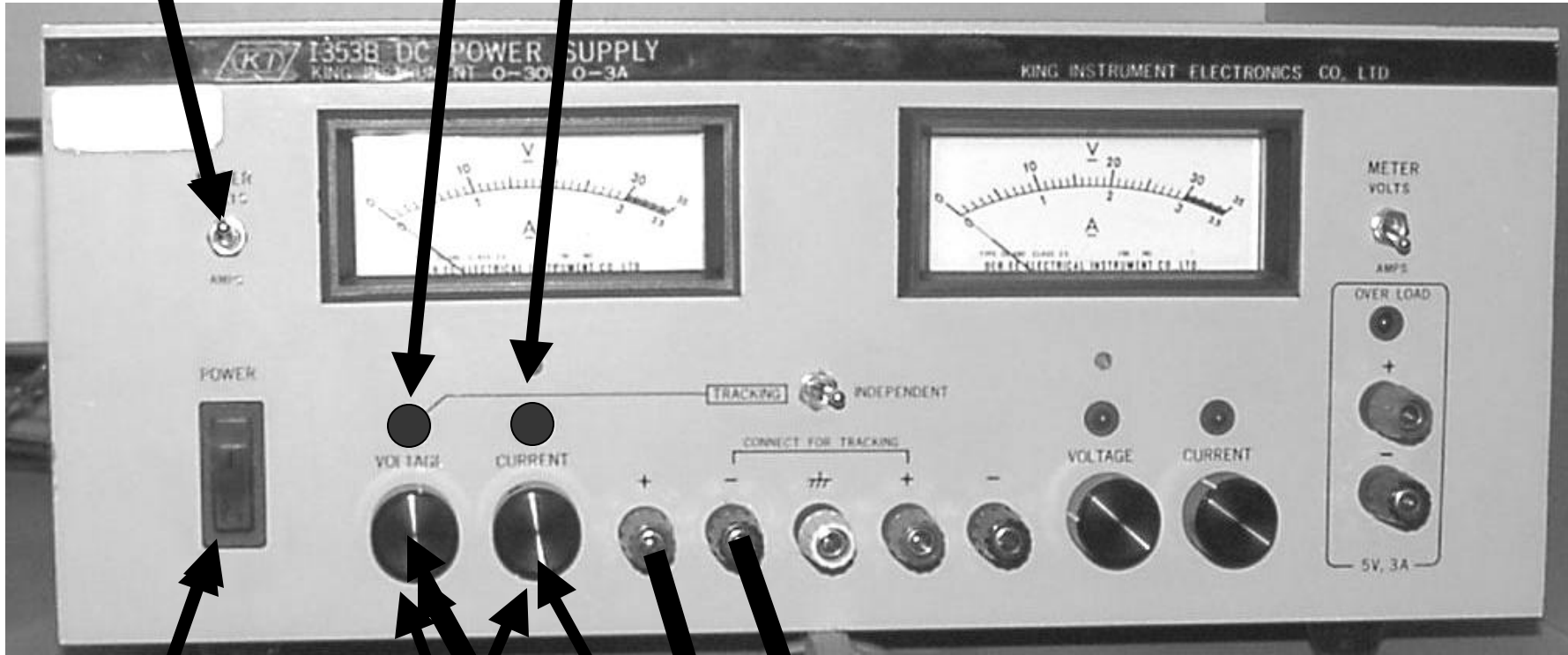
For this measurement the value is $[0.812 \pm 0.001]$ V

↗ 0.813 V
↘ 0.811 V

How to set-up Power Supply Single Supply (source)

Flick this
Switch to
measure
voltage

This LED lights-up
This LED lights-up



Make sure
this switch
is off

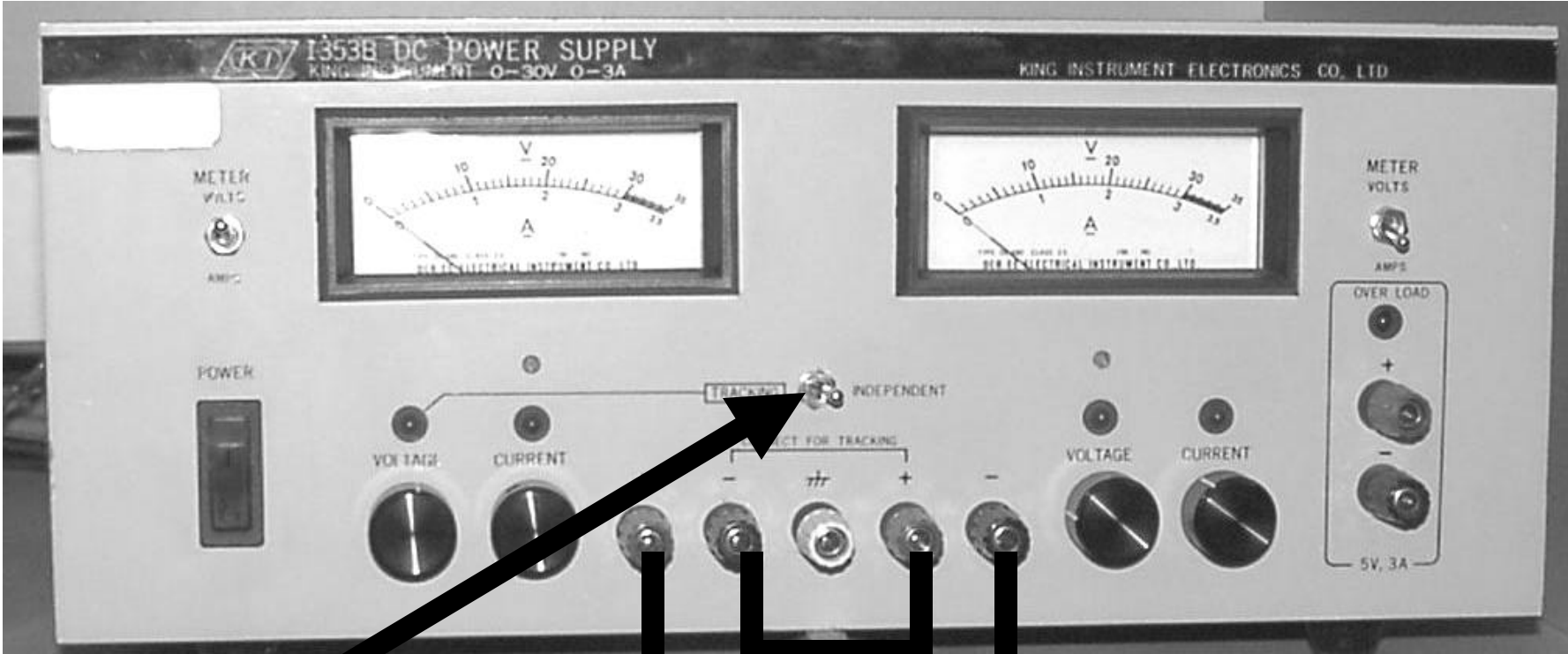
Rotate the voltage knob
clockwise and set the desired
voltage
Rotate the current knob
slightly clockwise
max current

Remove this short

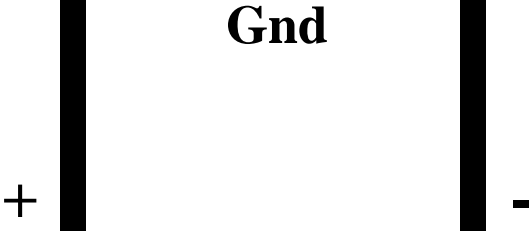
How to set-up Power Supply

Dual Supply

Set current limit for both sides as described before.

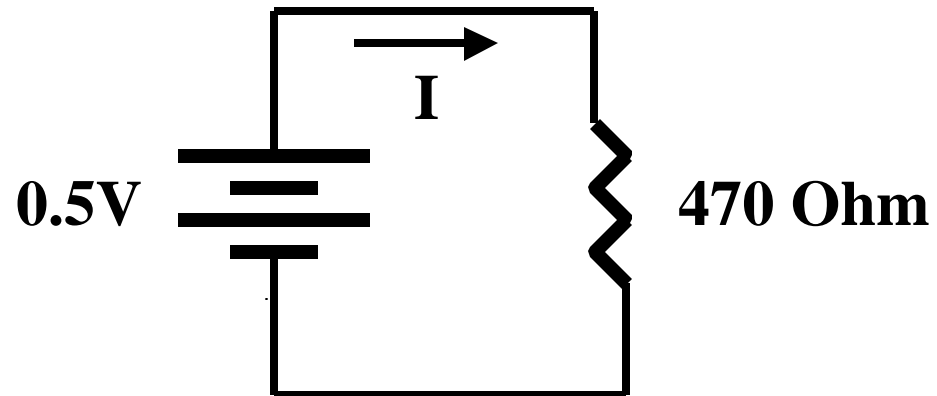


Set this switch for tracking when you want both the supplies to have equal magnitude



A Sample Experiment

Design



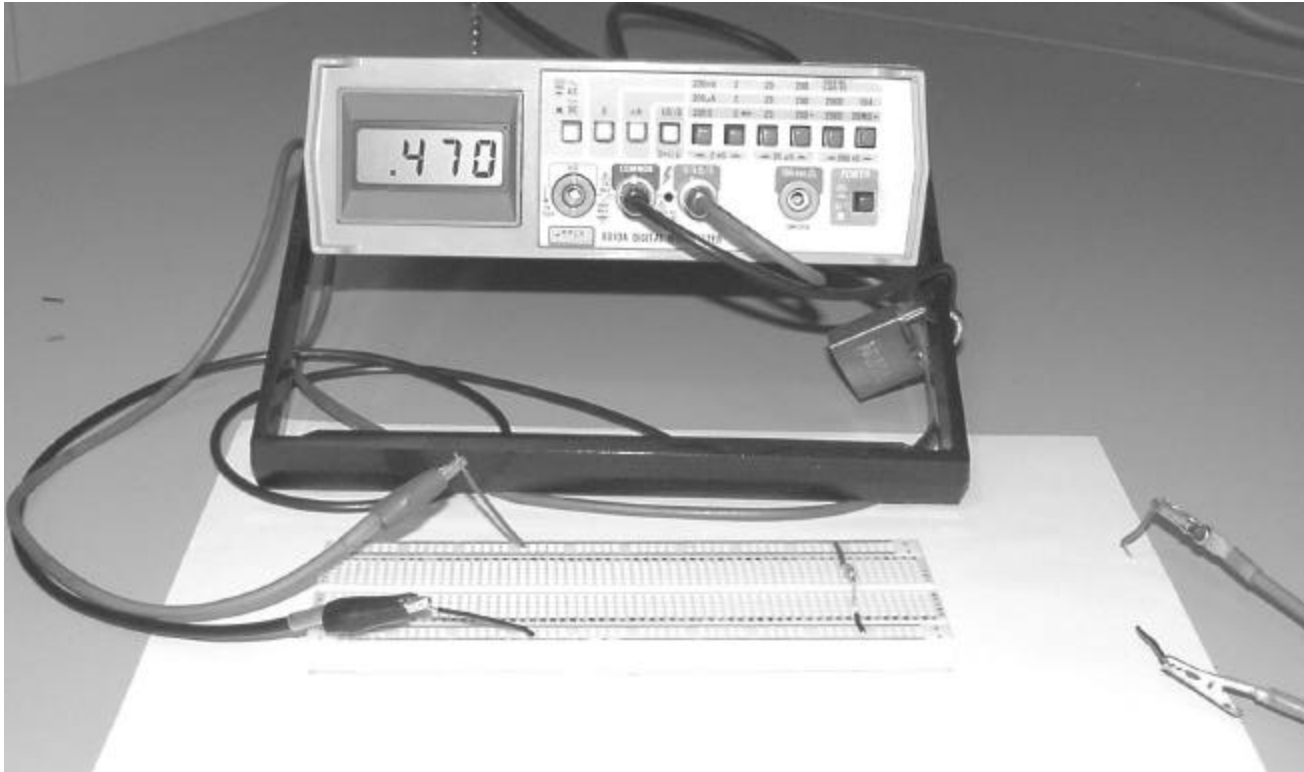
What is the
Value of I

Theoretical Value

$$\frac{0.5V}{470 \text{ Ohm}} = 1.063829 \text{ mA}$$

First Level Experiment/Calculation

Measure the resistance using an Ohm-Meter

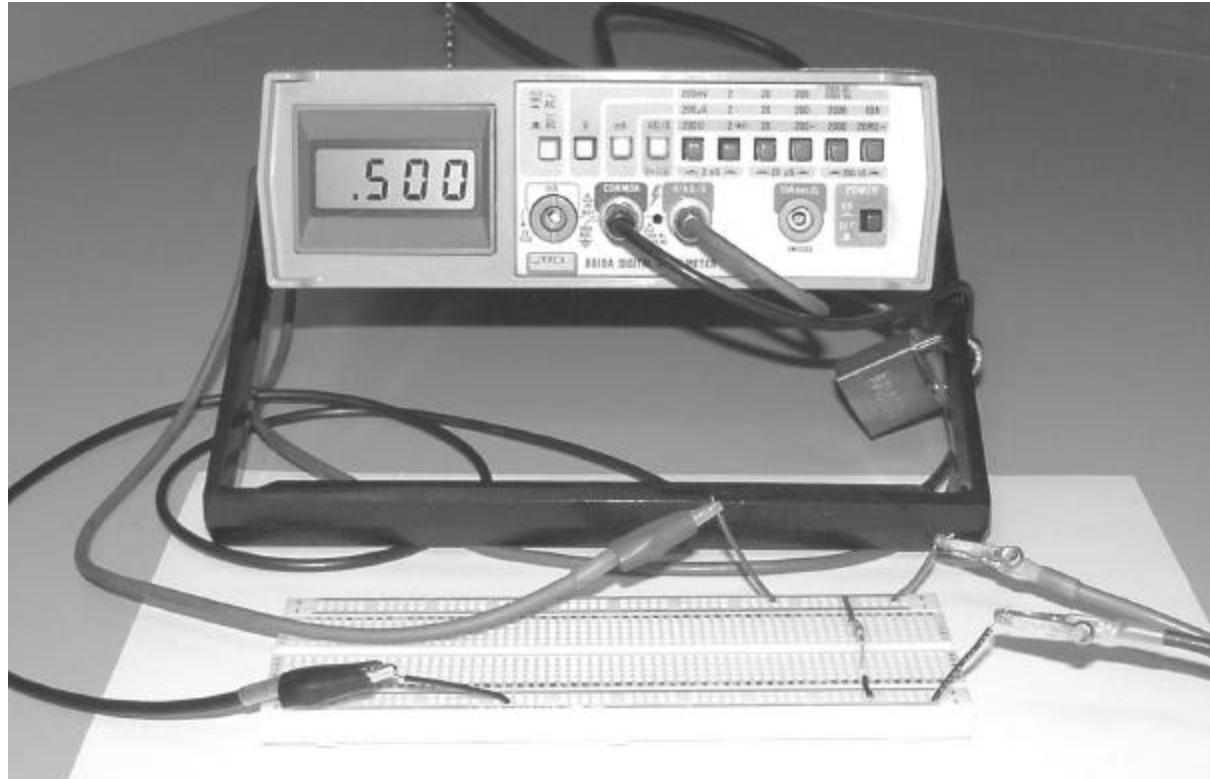


2K Ohm Range, therefore the value is 0.470 ± 0.001 KOhms

Max value = 471 Ohms, Min value = 469 Ohms

First Level Experiment/Calculation..... continued

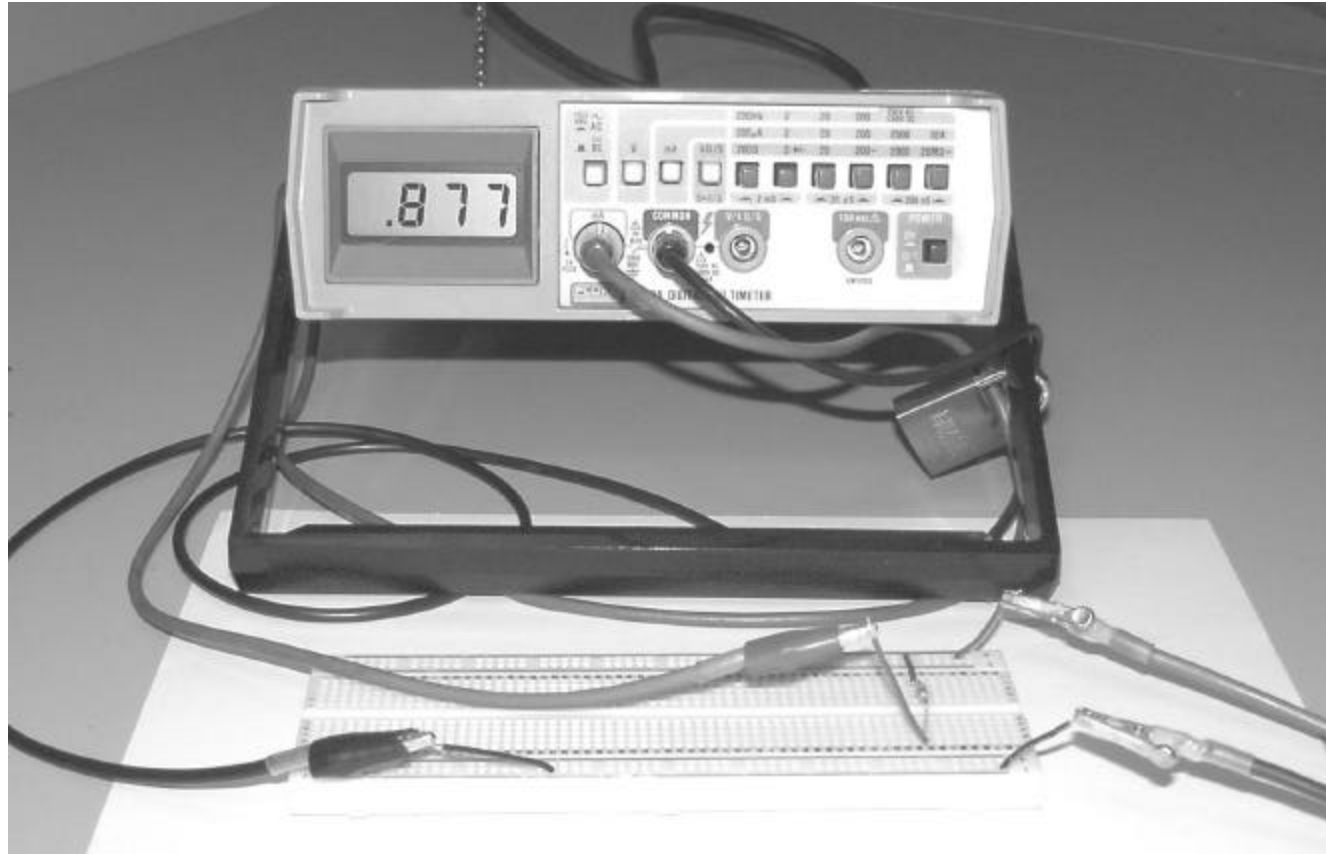
Measure the voltage of the supply



2V Range, therefore the value is 0.500 ± 0.001 V

Max value = 0.501 V, Min value = 0.499 V

Measure Current



2mA Range, therefore the value is 0.877 ± 0.003 mA

Max value = 0.88 mA, Min value = 0.874 mA

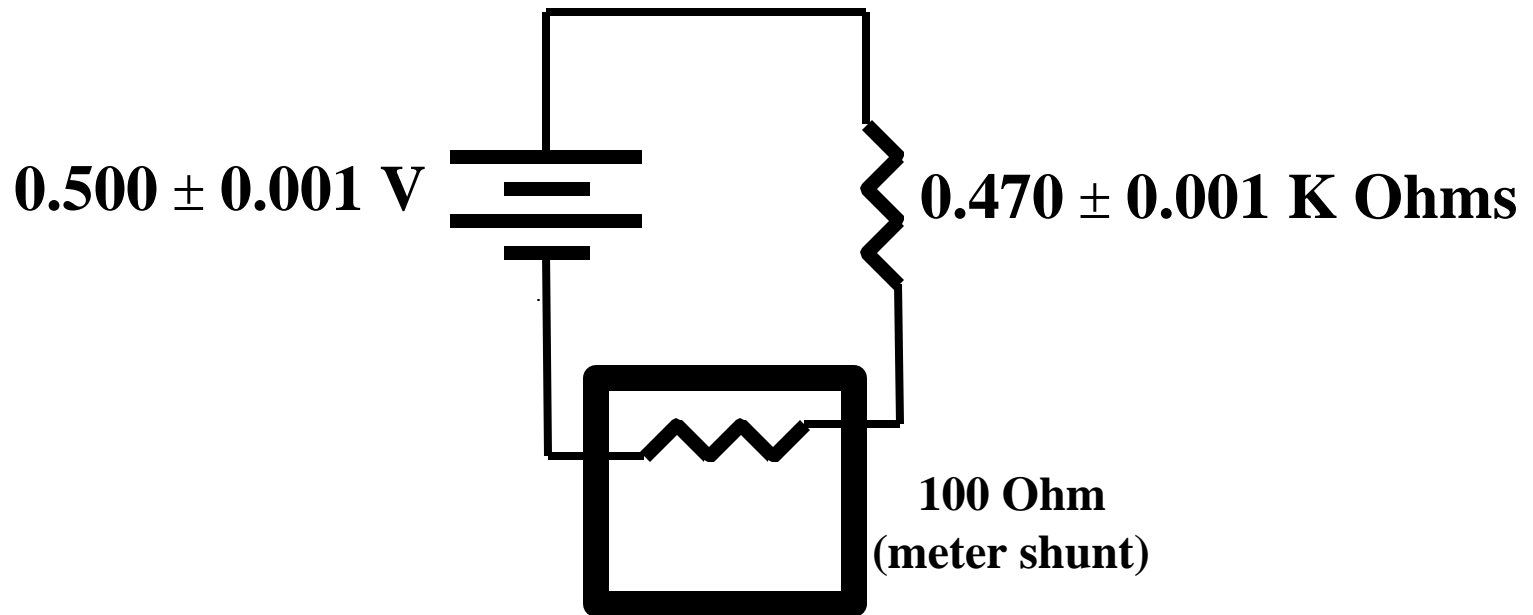
Our theoretical value is = 1.063829 mA

**Some thing weird
going on here !**

Internal Resistance of the Meter (Shunt)

2mA	100 Ohm
20mA	10 Ohm
200mA	1 Ohm

Real Circuit



Reconcile measurement results with expected values

Voltage Measurement:

Max value = 0.501 V, Min value = 0.499 V

Resistance Measurement:

(Max value = 471 Ohms, Min value = 469 Ohms) Plus 100 Ohms

Calculated Current:

$$\text{Max value} = \frac{0.501 \text{ V}}{569 \text{ Ohms}} = 0.8804 \text{ mA}$$

$$\text{Min value} = \frac{0.499 \text{ V}}{571 \text{ Ohms}} = 0.8739 \text{ mA}$$

Measured Current

$$\text{Max value} = 0.880 \text{ mA}$$

$$\text{Min value} = 0.874 \text{ mA}$$

We have excellent reconciliation when the calculated
And measured values match well within the meter's accuracy