Submit Project # 1 Reports Next Week

- **Read the Project # 1 Deliverables document**
- **Priorities in lab today**
  1. Verify Project # 1 with Template resistor values
  2. Insert your resistor values in theoretical & measured sections
  3. Project # 1 Excel file
     - Clear values in the measured columns
  4. Build circuit and measure R_{th}, V_G, and V_{th}
     - % difference R_{th} and V_{th} should be ≤ ≈1-2%
       - Resolve problems before proceeding
- **Reclaim your resistors for Project # 1**
- **MATLAB = verify measured data before you leave**
- **Questions ?**

Project # 1

- **Pre-lab = Read project & tutorial + the following:**
  - **MATLAB code working properly & verify your measurements**
    - Run simulation => Compare with solution
      1) Use standard values => use values below for initial simuation
      2) Then use your selected values
         - Final lab values => 500 Ω ≤ R_n ≤ 2 kΩ, n = {1,2,3,…8, 10}
    - (Required) MATLAB "Publish" for your documents
  - R_1 through R_8 < R_{10} , and R_9 is variable

- **Decade Resistance Box**
  - Use as R_9 when making measurements
- **Measurements today**

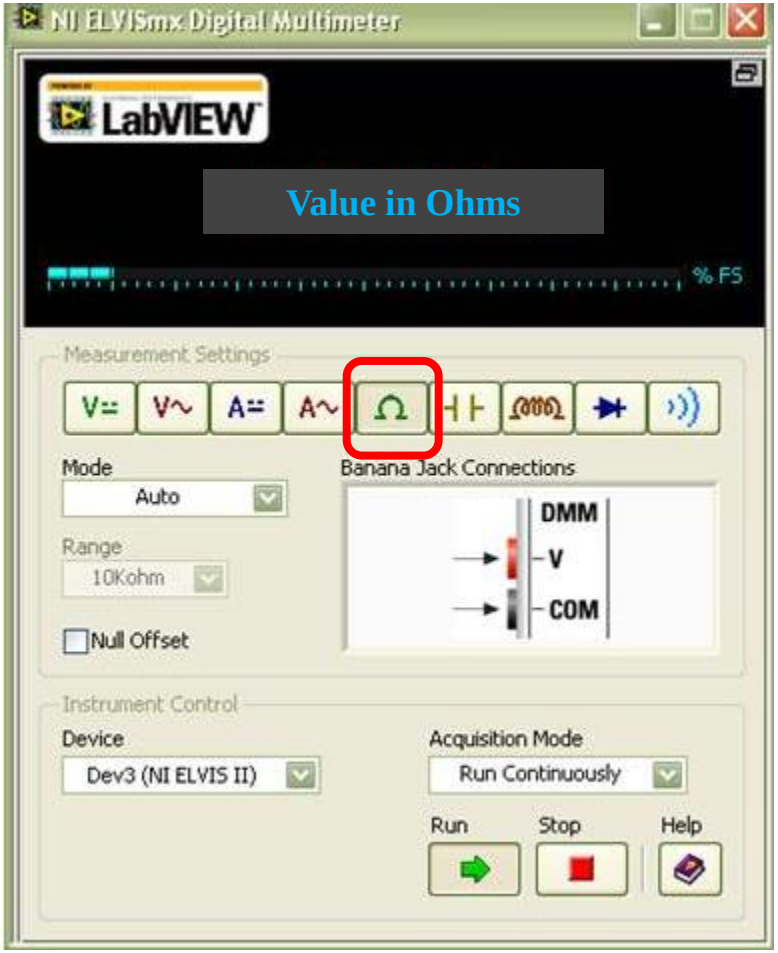
Setup global variables

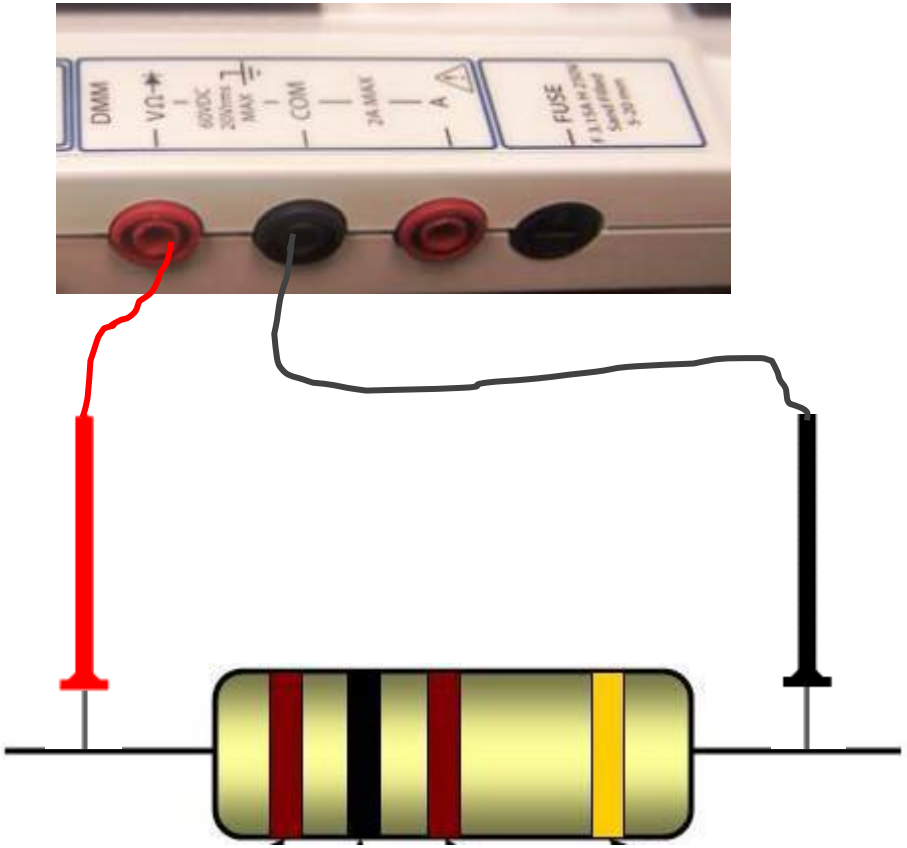
```
% These element values are fixed in the circuit.
VG  = 12;           % Generator voltage
R1  = 1000;         % Ohms
R2  = 1000;         % Ohms
R3  = 1000;         % Ohms
R4  = 500;          % Ohms
R5  = 500;          % Ohms
R6  = 500;          % Ohms
R7  = 500;          % Ohms
R8  = 1000;         % Ohms
R10 = 500;          % Ohms
% This element value is the R9 variable in the circuit.
R9 = [1:10:10^5];   % Ohms
```

Project # 1

- **MATLAB code design (3 files => script & functions)**
  - Template code has been provided
    - You will fill in the missing code sections
  - MATLAB Publish must be Word Document format
  - Required approach
    - MATLAB Publish + Measurements + Hand calculations
    - Answer the questions in the Deliverables document
  - Verify your code is working properly with TA
  - Use Excel blank template to record measurements
  - Take Measurements in lab today
    - Plotting: use MATLAB **semilogx()** and **makedatatip()**

Measure all resistors first



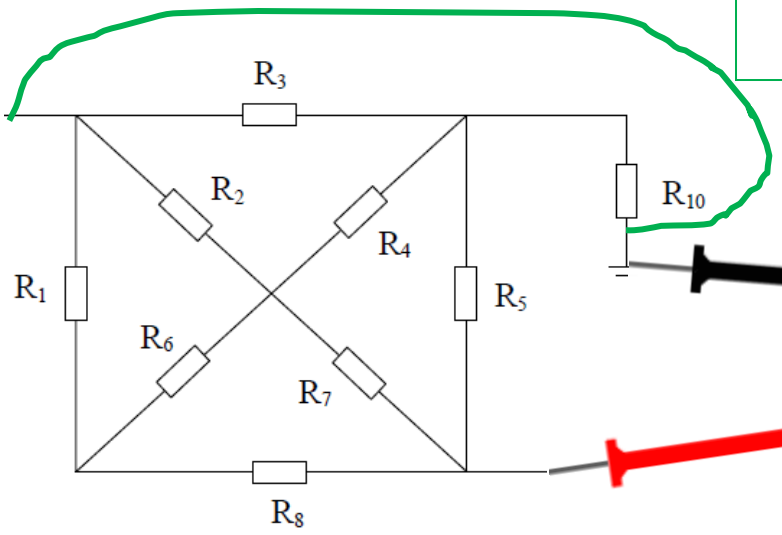


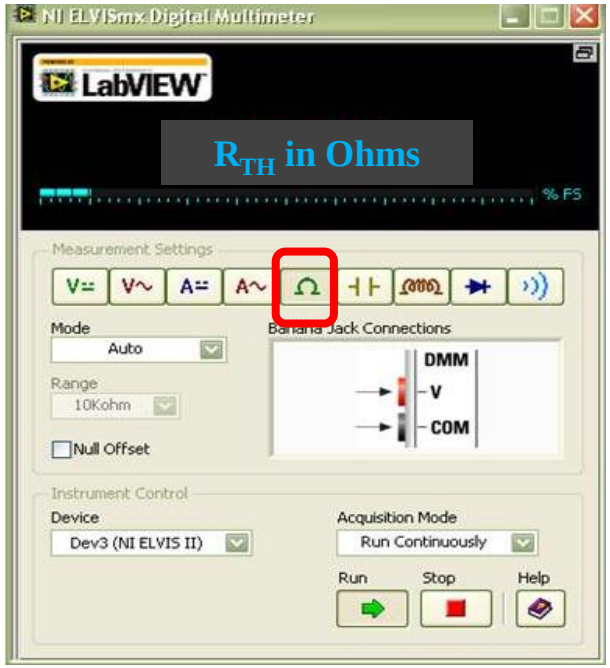
Measuring R_{TH}

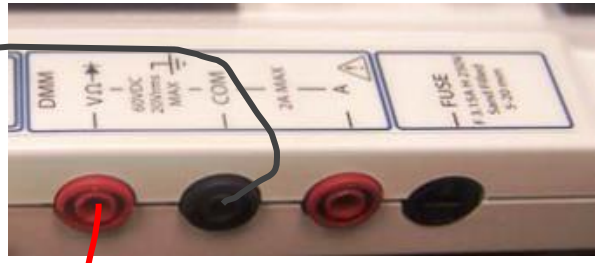
Turn off the Prototyping Board Power Switch to disable VPS's

Disconnect R9 and the VPS. Then put a short in place of the VPS.

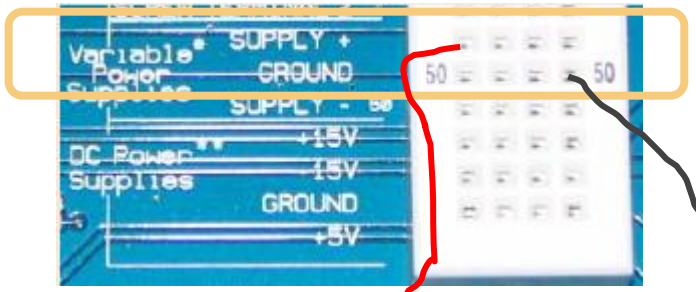
Connect the Ohm meter

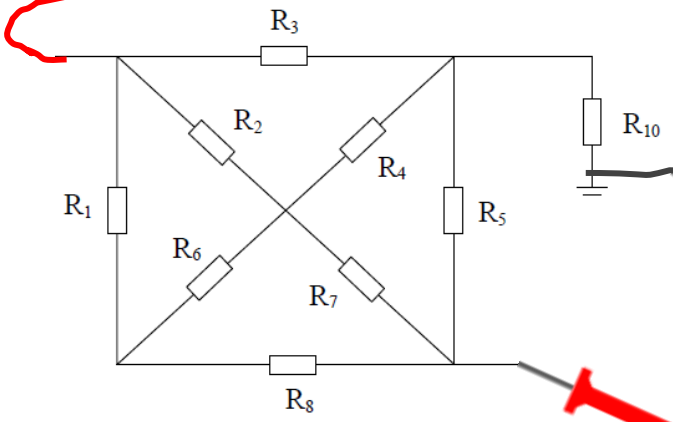






Measuring V_{TH}

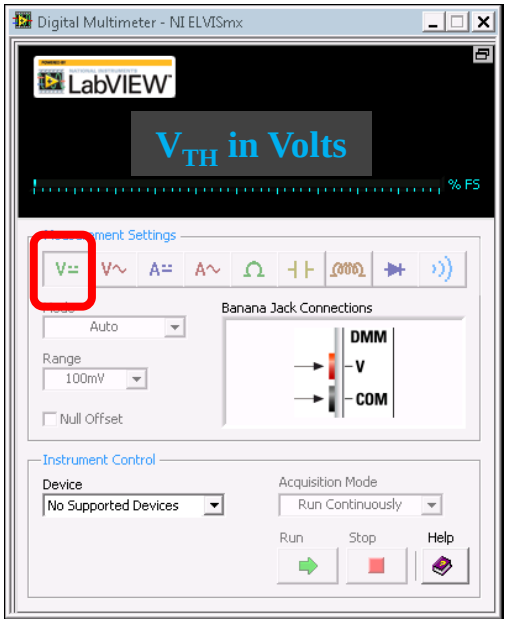


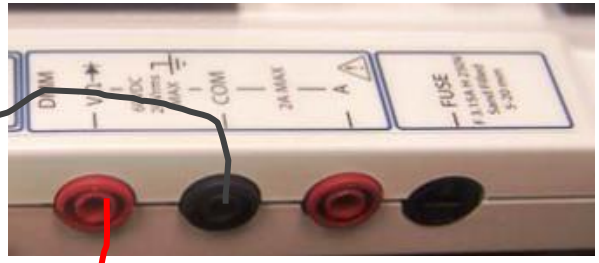


Turn on the Prototyping Board Power Switch.

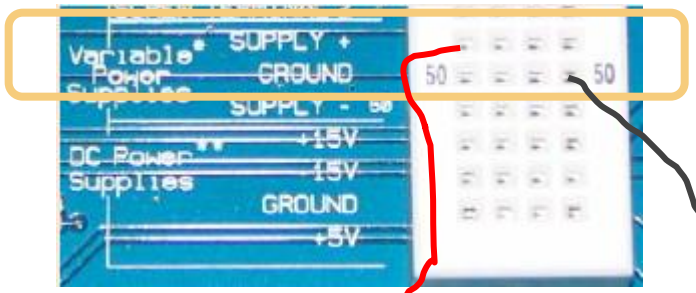
Disconnect R9 and connect the VPS = +12V.

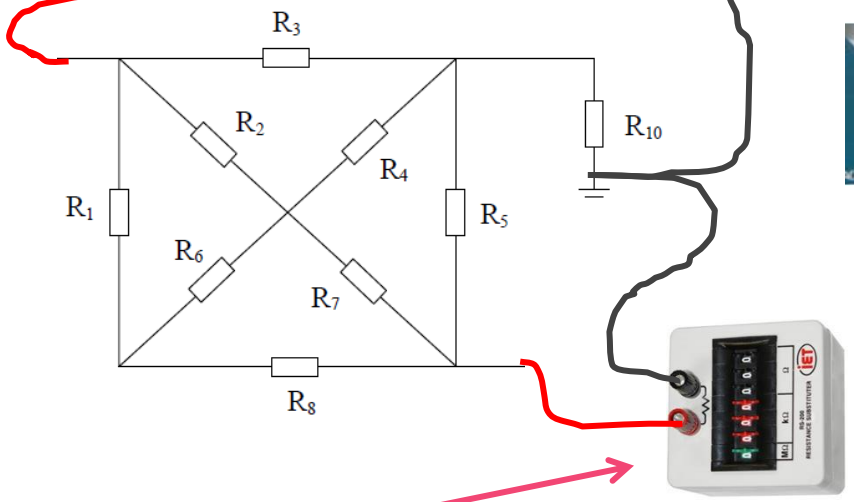
Connect the Volt meter



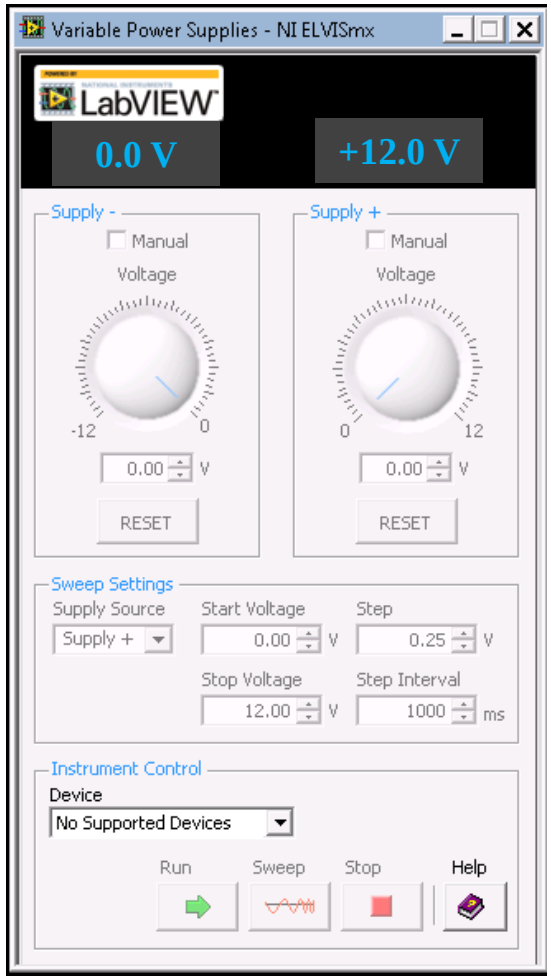


Full circuit configuration



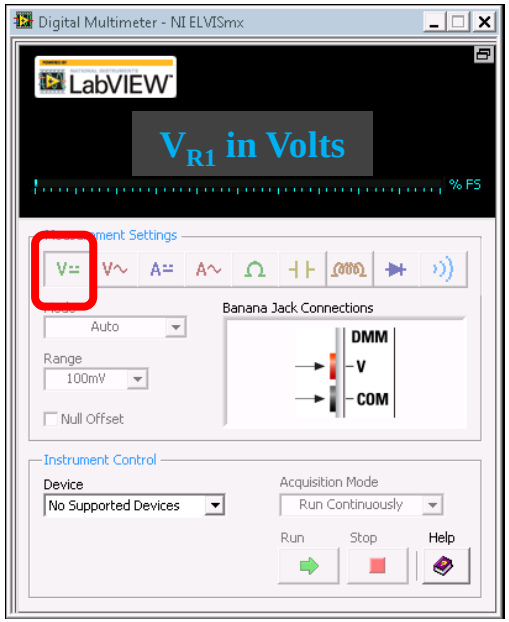


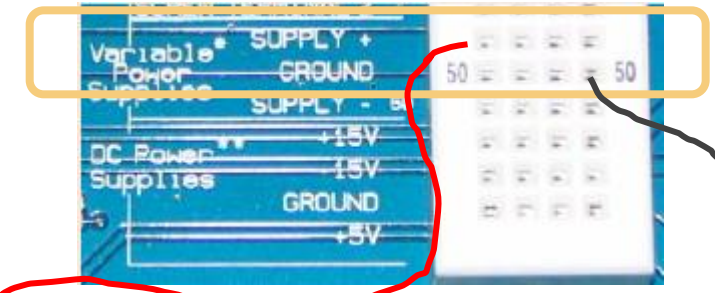
Turn on the Prototyping Board Power Switch to enable VPS's

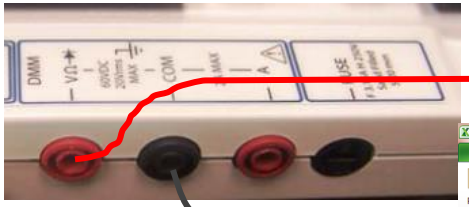


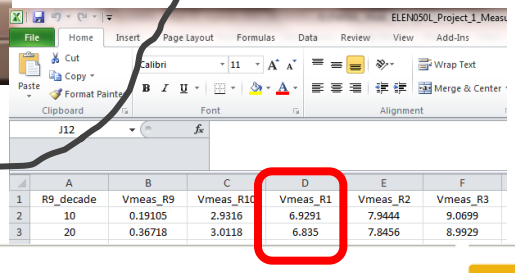
R_9 = Variable resistor

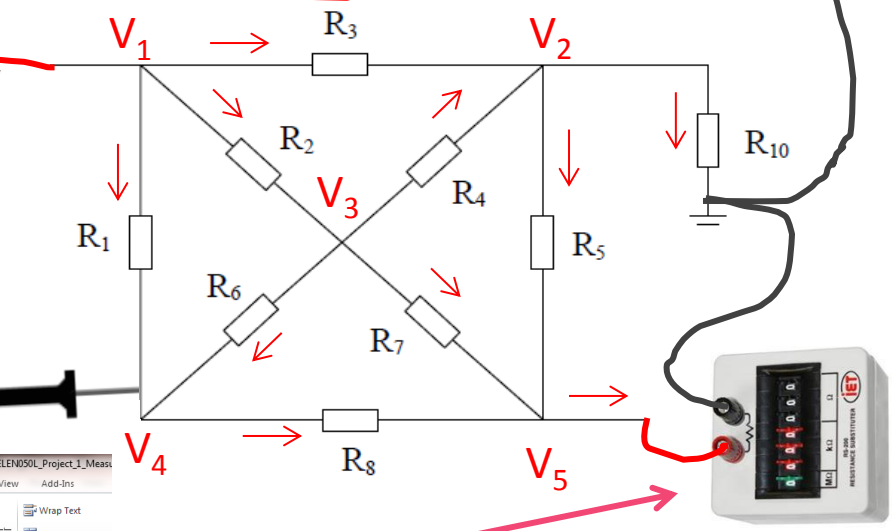
Measuring Voltage Vmeas_R1







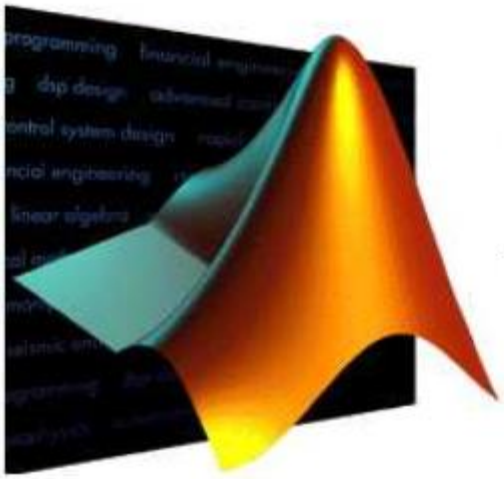




R_9 = Variable resistor

Project # 1

MATLAB Verification



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