

## Homework #2

LabVIEW

Dr. Pogo

Assignment is due on Tuesday, September 9, 2008

Assigned September 2, 2008

### Assignment #2: Voltage to Temperature Conversion

- Inputs:**
- One “active” button.
  - One “stop” button.
  - One Floating Point (slider with digital display).
  - One Ring (4 elements: Celsius, Kelvin, Fahrenheit, Rankine)
- Outputs:**
- One Floating Point (waveform chart).
  - One Date and Time Display
  - One string indicator (“too low”, “normal”, “too high”).

- A. Create a subVI (*with appropriate icon and description*) based on a slightly modified assignment #1, where:

$$T (^{\circ}\text{C}) = 123.4V + 8.62V^2 \quad (-1\text{volt} = V = +1\text{volt})$$

Use expression nodes to generate the 4 temperatures. The subVI should have the following connectors:

1. One input voltage (floating point)
2. 4 Output temperatures (floating points; Celsius, Kelvin, Rankine, and Fahrenheit)
3. An “input too high” output (Boolean)
4. An “input too low” output (Boolean)

You’ll need to submit this subVI along with your main program for me to get it to work! The program name for the subvi should be: 02-**abc12**sub.vi, where the part in bold is your Geneseo email address.

- B. The main program (02-**abc12**.vi) must use the subVI described above. However, due to the requirements below, you will probably end up using only one of its 4 outputs. You may not use any “visible” property nodes, but you may use “text/background color”.

The chart should update every 50ms only when the “Data Active” switch is “On” (otherwise, it should pause). Also, the user may adjust the slider only when the “Data Active” switch is on. When the units “Ring” is adjusted, the data *already* displayed on the chart should also adjust to be correct with the new units (use the Yscale.offset/multiplier property nodes).

The slider should accept voltages between  $-2$  and  $+2$  volts. As with assignment #1, if the input voltage ever falls outside the expected range, the temperature should “peg” at the  $-1\text{v}$  or  $+1\text{v}$  value, as appropriate.

The label and scale of the strip chart should automatically adjust as follows:

Celsius:	$-150^{\circ} \leq T \leq +150^{\circ}$
Kelvin:	$+150^{\circ} \leq T \leq +450^{\circ}$
Fahrenheit:	$-200^{\circ} \leq T \leq +300^{\circ}$
Rankine:	$+200^{\circ} \leq T \leq +800^{\circ}$

Here is an example of how your front panel might appear:

