

## BASICS OF INSTRUMENTATION LABVIEW EXERCISES

As a reference, download the *LabVIEW Fundamentals* manual from the National Instruments website

<http://www.ni.com/pdf/manuals/374029a.pdf>.

Additionally, the best guide is always the LabVIEW help. Try Ctrl+?

### MICRODRIVE CONTROL - PART 2

*Move to a predefined position.* Add a control for the desired target position. Use a 1-element queue to send the current position from the sensor loop to the motor loop. Then a click on the *move* button should:

- send a command to the motor if the target position has not been reached
- stop the vi if the current position is within a 10um range around the target

*Relative to absolute position.* For each N-S couple on the magnetic strip you get position values between 0 and 2mm. When you move to the next couple, you see steps from 0 to 2 and vice versa. When you detect any of such steps add or subtract 2mm to the current position so that the value you plot is the absolute position of the motor. Add a *reset* button to manually select the beginning of the magnetic strip.

Hint: use a case structure in a sub-vi.

*Cleanup your vi.* About the front panel: imagine your vi will be run by someone who doesn't know how to use LabVIEW, they only want to do an experiment. About the block diagram: imagine another person has to read your code and modify or debug it. The diagram needs to be easily understandable. Take a look at

<http://zone.ni.com/reference/en-XX/help/371361E-01/lvdevconcepts/checklist/> and try to implement the following points:

- *Give controls meaningful labels and captions.*

- *Set controls with reasonable default values.*
- *Configure numeric inputs with data ranges.*
- *Arrange controls logically.*
- *Group and arrange controls attractively.*
- *Provide a stop button if necessary. Do not use the Abort button to stop a VI. Hide the Abort button.*
  
- *Avoid creating extremely large block diagrams. Limit the scrolling necessary to see the entire block diagram to one direction.*
- *Use comments on the block diagram to explain what the code is doing.*
- *Make sure data flows from left to right and wires enter from the left and exit to the right.*
- *Align and distribute functions, terminals, and constants.*
- *Avoid placing block diagram objects, such as subVIs or structures, on top of wires, and do not wire behind objects.*
- *Make sure the program can deal with error conditions and invalid values.*
- *If you open references to a LabVIEW object, such as an application, control, or VI, close the references by using the Close Reference function.*

**That's all folks!** Don't forget to send us all your vi's.