ATI Mini40 DAQ F/T sensor information and tips

Iris David Du Mutel

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Abstract

This document is meant to be a summary of all the relevant information I have found while working with the ATI Mini40 DAQ F/T sensor. It contain all the information and instructions to operate such sensor in various environments such as LabView, Python and MATLAB using the Keysight 34970A Data Acquisition Unit.

1 What kind of sensor is the ATI Mini40 DAQ F/T

2 Wiring and connecting to a DAQ

2.1 Sampling

3 Keysight 34970A connection to PC

The connection is made via a GPIB-USB-HS cable. The GPIB-USB-HS is an IEEE 488 controller device for computers with USB slots. The GPIB-USB-HS achieves maximum IEEE 488.2 performance. The exact model can be found in Amazon. The differences with the original true version of this device are not the sxope of this document.

4 LabView

LabView offers two main ways of interacting with the Keysight 34970A DAQ:

- General purpose Virtual Instrument Software Architecture (VISA) blocks.NI-VISA is an API that provides a programming interface to control Ethernet/LXI, GPIB, serial, USB, PXI, and VXI instruments in NI application development environments like LabVIEW, LabWindows/CVI, and Measurement Studio. The API is installed through the NI-VISA driver [1].
- Agilent Technologies / Keysight Technologies 34970A drivers. These block are based on the VISA blocks but offer a more user-friendly approach to configuring the instrument as well as reading data from it.

The example provided in this repository uses generic VISA blocks. In Figure 1, the block diagram of the VI can be seen:

Inside the while loop, the write and read blocks are interacting with the instrument. Every iteration, the *write* block sends the following commands to the DAQ:

- DISP OFF: This command turns off the display of the external instrument. This speeds up the sampling process.
- MEASure:VOLTage:DC? 10V, 0.001, (@101:106): The first part of the command 'MEASure:VOLTage:DC?' is requesting the measurement of the voltage. The question mark indicates a query command. The two numbers following such query are the *range* and the *resolution*, respectively. There are alternative values for these parameters. See more in pages 211 to 217 from the manual.

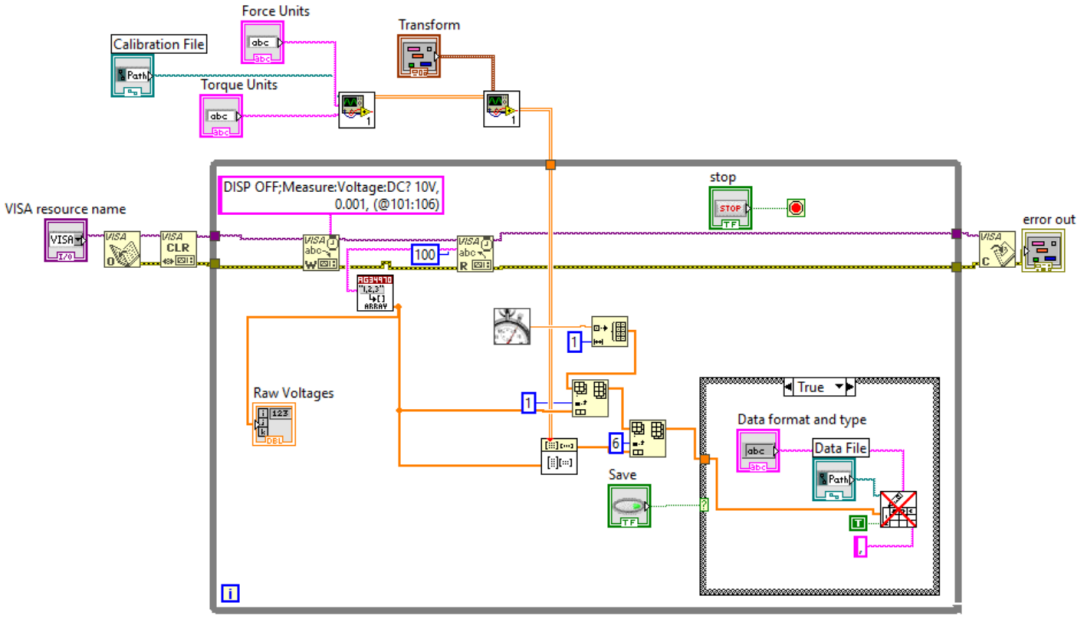

Figure 1: LabView block diagram

5 Python

References

[1] "Ni-visa overview - ni." [Online]. Available: https://www.ni.com/en/support/documentation/supplemental/06/ni-visa-overview.html

[2] "Agilent technologies / keysight technologies 34970a data acquisition unit - instrument driver - national instruments." [Online]. Available: http://sine.ni.com/apps/utf8/niid_web_display.model_page?p_model_id=5547