

Benchmarking the Reading Rate of an Integra Mainframe: Model 2700, 2701 or 2750

The DC Measurement Speeds specifications for the Integra mainframes are defined as the rate at which data can be acquired and put into a memory buffer. In order for your application to have this data for analysis, additional time is required to transfer the data across the bus (GPIB, RS-232 or Ethernet).

In order to verify the speed specification, analysis of the data returned when applying a signal of known frequency is required. If a 1 Hz waveform is applied and a buffer of data equal in size to the maximum rate is acquired, then the data in the buffer should represent 1 second or 1 full cycle of the applied waveform.

Below is a screen shot from a LabVIEW program that performs this benchmark. This example, in LabVIEW 6i, is available in the download center of the Keithley web site as an example program for the Model 2700. It uses NI-VISA to send SCPI commands to the 2700 over GPIB.

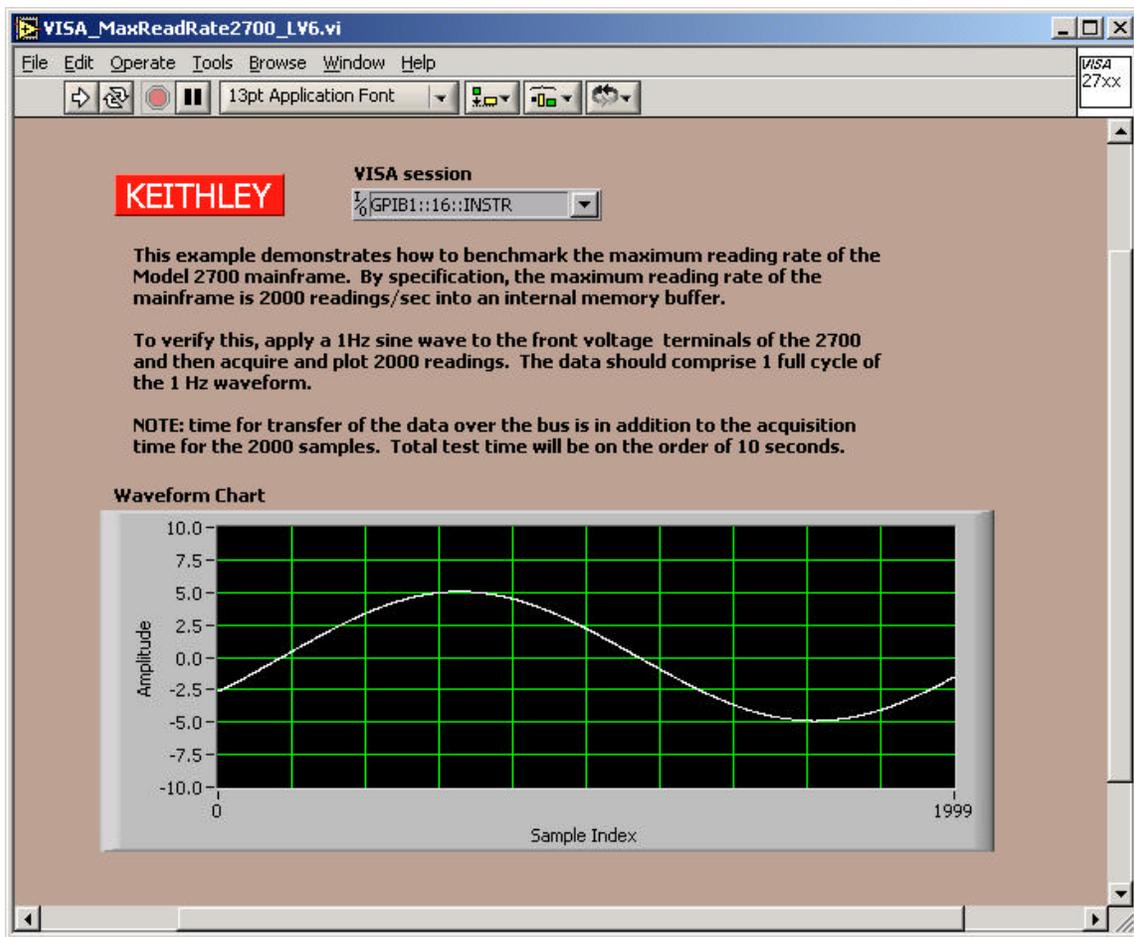


Figure 1: One Cycle of Applied Sine Wave

As the Waveform Chart shows, one complete cycle of the applied sine wave has been acquired in the 2000 buffer points for the 2700.

If using a 2750, adjust the buffer size to 2500 samples. If using a 2701, adjust the buffer size to 3500.

Below are the SCPI commands used in the program:

*RST;*CLS;	Reset the instrument; clear status and errors
TRAC:CLE	Clear the buffer
INIT:CONT OFF	Disables continuous initiation (auto run)
:SENSE:FUNCTION 'VOLT:DC'	Measure DC volts
:FORMAT:ELEM READ;	Store only the reading in the buffer
:SYSTEM:AZERO:STATE OFF	Do not use auto zero
:SENSE:VOLT:DC:AVERAGE:STATE OFF	Disable filters
:SENSE:VOLT:DC:NPLC 0.01	Set integration rate; 2701 has 0.002 available
:SENSE:VOLT:DC:RANGE 10	Use a fixed range
:SENSE:VOLT:DC:DIGITS 4.5	Set the reading resolution
:TRIGGER:COUNT 1	Only one trigger required
:SAMPLE:COUNT 2000	Change Sample Count according to your Model
:TRIGGER:DELAY 0.0	Do not delay after trigger is issued
:DISPLAY:ENABLE OFF	Turn off the front panel display
:READ?	Issue software trigger